ORDER NO. HAD8706158C0
A6

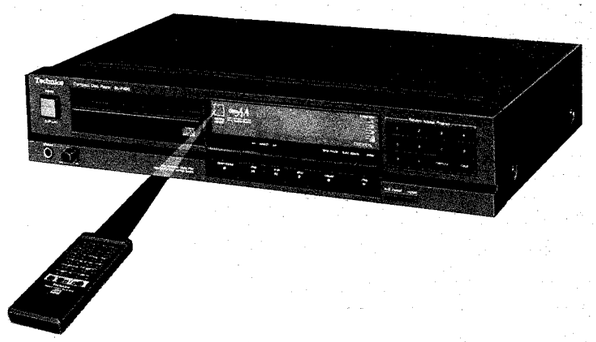
Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-P420



Color

(K)	.....Black Type
(S)	.....Silver Type

Area

Color	Area
(K)	(M).....U.S.A.
(K)	(MC).....Canada.
(K)(S)	(E).....Switzerland and Scandinavia.
(K)(S)	(Ei).....Italy.
(K)(S)	(EG).....F.R.Germany.
(K)(S)	(EB).....Belgium.
(K)(S)	(EK).....United Kingdom.
(K)(S)	(EF).....France.
(K)(S)	(EH).....Holland.
(K)(S)	(XL).....Australia.
(K)(S)	(XA).....Southeast Asia, Oceania,Afirca. Middle Near East and Central South America.
(K)(S)	(PA).....Far East PX.
(K)(S)	(PE).....European Military.
(K)(S)	(PC).....European Audio Club.
(K)(S)	(XB).....Saudi Arabia.

SPECIFICATIONS Measured by EIAJ(CP-307)

■ Audio

Number of channels: 2 (left and right,stereo)
Frequency response: 2 ~ 20,000 Hz (±0.3dB)(EIAJ)
Dynamic range: 96dB (EIAJ)
S/N ratio: 99dB (EIAJ)
Harmonic distortion: 0.002% (1kHz,0dB)
Total harmonic distortion: 0.004% (1kHz,0dB) (EIAJ)
Channel separation: 100dB (EIAJ)
Wow and flutter: Below measurable limit
Low-pass filter: High-resolution digital filter

■ Signal Format

Sampling frequency: 44.1kHz
Correction system: Technics Super Decoding Algorithm
D-A conversion: 16-bit linear

■ Pickup

Access time: 1 second (access to the last track)
Light source: Semiconductor laser
Wavelength: 780nm
Traverse system: High-speed linear access system

■ Functions

Automatic play: All tracks
Direct access play: Track number or index number
Repeat play: Entire disc or programmed tracks, A-B repeat
Search: Forward/backward track skip, Forward/backward manual search
Program play: For up to 20 selections
Preset edit play: Up to 99 minutes (for program play)
Display: Total tracks (up to 99), Programmed track, Current track, Time display (min.,sec./dB), Time modes display
Indicators: Music matrix (20), Overflow indicator, Disc indicator, Repeat indicator, A-B repeat indicator, Play indicator, Pause indicator, Auto space indicator
(When operating remote control unit)
Programmed order(No.)indicator
Mnsic scan indicator
Output level indicator(dB)
Disc loading: Motor-driven horizontal type
Headphone output level: 80mW max. 32Ω(variable)
Headphone Plug: 1/4 inch stereo

Technics

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Secaucus, New Jersey 07094

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6th Floor, world Trade Center Bldg.,
No. 4-1, Hamamatsu-chó 2-Chome,
Minato-ku, Tokyo 105, Japan

■ General

Power supply: For U.S.A. and Canada: AC120V,60Hz; For United Kingdom and Australia: AC240V,50Hz; For Continental Europe: AC220V,50Hz; For Others: AC110~127V/220~240V,50/60Hz
Power consumption: 17W
Output voltage: 2V (at 0dB) (EIAJ)
Output impedance: Approx. 600Ω
Load impedance: More than 10kΩ
Dimensions(WxDxH) 43 X 26 X 8.7 cm (16-15/16" X 10-1/4" X 3-7/16") <When disc holder is opened: 40.2 cm (1-9/16") (D)>
Weight: 4.3kg (9.5 lbs.)

■ Infrared remote control unit

Dimensions(WxDxH) 6.5 X 15.5 X 1.8 cm
Batteries: UM-3 "AA" batteries or IEC R6 or equivalent (1.5V X 2)
Weight: 140g (including batteries)

Specifications are subject to change without notice.
Weight and dimensions are approximate.

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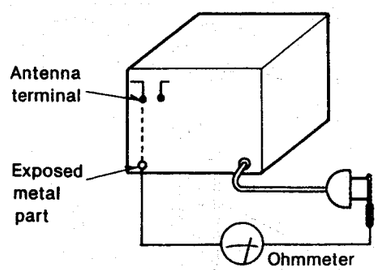
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

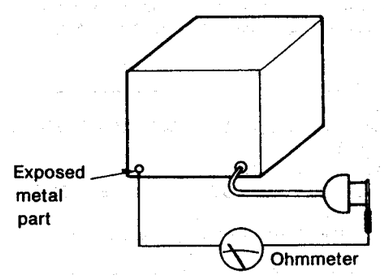
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



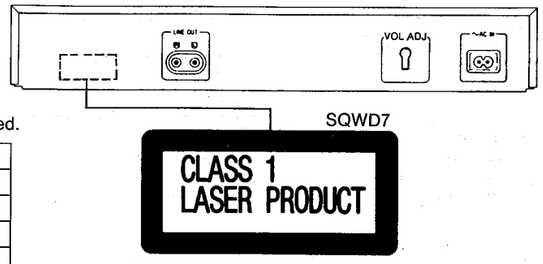
(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

■ PRECAUTION OF LASER DIODE

Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.



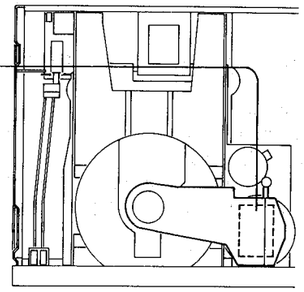
Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

• Use of caution labels

Note: ○ Mark is used,
× mark is not used.

Areas	SQWD33	SQWD7	SQWD19	SQWD47	SQWD48
[M]	×	×	×	○	×
[MC]	○	×	×	×	×
[E]	×	×	×	×	○
[EK], [XL], [EG], [EB], [EH], [EF], [Ei], [XA]	×	○	○	○	×
[XB]	×	○	○	×	×

"CAUTION–HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION—RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SQWD33



SQWD48

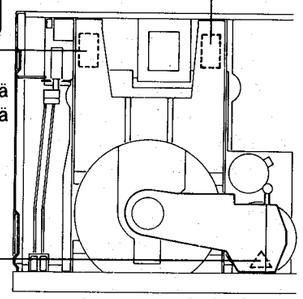
ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.

SQWD47

DANGER-Invisible laser radiation when open. AVOID DIRECT EX—POSURE TO BEAM.

VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya

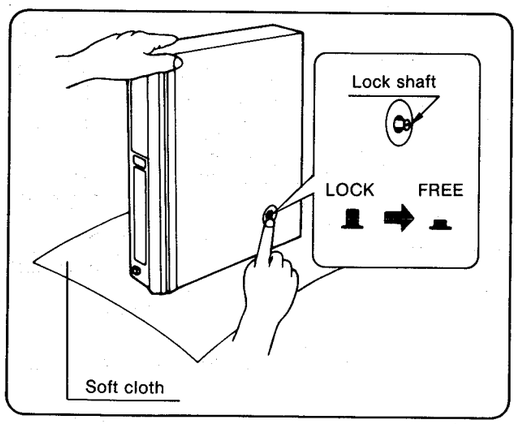
SQWD19



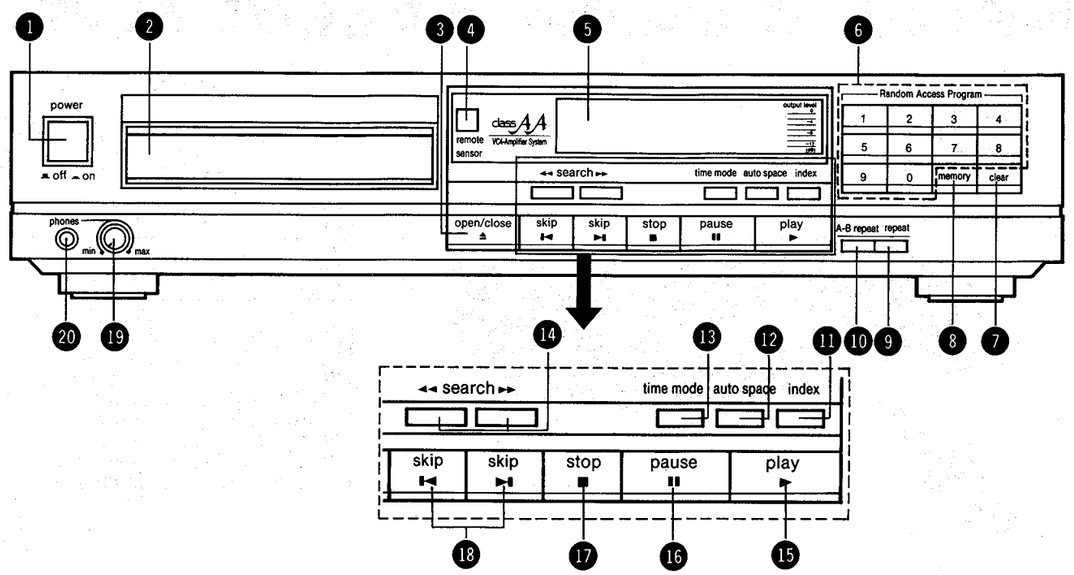
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in (FREE) position (▙▁▁▟).

NOTE:
IF THE PLAYER IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING STEPS:
1) Remove the disc from the holder.
2) Press the lock shaft to the out (LOCK) position (▟▁▁▙).
CAUTION:
Do not transport the player without locking the lock shaft.
SEVERE DAMAGE WILL RESULT.



■ LOCATION OF CONTROLS AND FUNCTIONS



❶ Power switch

Press (▙→▁) to switch power on.
Press again (▁→▙) to switch power off.

❷ Disc holder

The disc is inserted in this holder with the label side up.

❸ Open/close button

Press this button to open and close the disc holder.

❹ Remote control sensor

Receives signals from the infrared remote control unit.

❺ Display panel

❻ Numeric buttons (1 ~ 0)

Use these buttons to specify:
1. Track numbers
2. Index numbers
3. Times of repeat play (number of cycles)
4. Playing times

❼ Clear button

Press this button to clear individual program entries before program play is started.

❽ Memory button

Press this button to enter displayed track numbers or playing time into the memory.

❾ Repeat button

Press this button to activate the repeat mode.
The repeat indicator illuminates.
Press again to cancel the repeat mode.

❿ A-B repeat button

Press to repeat a section between two specified points A and B.
- The first time this button is pressed, the " A↻ " repeat indicator illuminates, and the starting point of the disc section to be played repeatedly is set.
- The second time this button is pressed the " A↻B " repeat indicator illuminates. The ending point of the repeat section is set.
- The section of the disc between these two points will now be played repeatedly until this button is pressed a third time to cancel the A-B repeat mode.

⓫ Index button

Press this button to specify an index number.

Index number:
In some compact discs, indexes are used to divide tracks into smaller sections for easy access. If a disc includes indexes, a list of the indexes will be contained in the liner note included with that disc.
[INDEX is the symbol for index(es).]

⓬ Auto space button

Press this button to set a silent interval of 3 seconds between the songs on a disc.

⓭ Time mode select button

Use this button to select the desired time display mode.
① Disc remaining playing time.
② Track number and remaining playing time of the current track.
③ Playing time from the beginning of the first track.
④ Track number and elapsed playing time from the beginning of the current track.
This button is also used to specify a preset playing time.

⑭ Backward and forward search buttons

Use these buttons to move the pickup forward and backwards (manual search play function).

> **Pickup:**
> The pickup is a laser device that reads the information on the disc surface. The pickup moves across the disc as the disc is played, but it is not visible from outside the cabinet.

⑮ Play button

Press this button to begin disc play.

⑯ Pause button

Press this button to briefly stop play.
To continue play, press the play button.

> **Pause mode:**
> Play is stopped, but the pickup remains where it was at the time when the pause button was pressed. The disc rotates while the unit is in the pause mode.

⑰ Stop button

Press this button to stop disc play and cancel all previous settings.

> **Stop mode:**
> In the stop mode, the pickup is at the beginning of the first track and the display shows the total number of tracks and total playing time of the disc.
> The disc does not rotate.

⑱ Backward and forward skip buttons

Use these buttons to move the pickup to the beginning of a specific track (forward and backward skip play function).

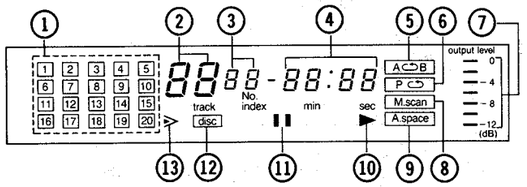
⑲ Phones level control knob

Use to control the output level to the headphones.

⑳ Headphones jack

Connect the optional headphones plug to this jack.
When listening to music with stereo headphones, avoid listening for prolonged periods of time. Hearing experts advise against continuous extended play.

Display panel



① Music matrix (□)

Up to 20 tracks are displayed.

1. When a disc is loaded, this display shows the total number of tracks.
2. When specifying or entering a track number in the memory, the border of the specified track number illuminates.
3. During play, the border around the track number currently being played flashes on and off.
4. When the track is finished, the border around the track number goes out.

② Track number display (track)

Track numbers (up to 99) are shown here.

③ Index number display (index/No.)

The index number (index) or programmed order (No.) is shown here.

④ Time display (min. sec./dB)

- During play, the current track number and track elapsed playing time is shown.
- Each time the time mode select button is pressed during play, this display changes to show one of four time modes.
- The digital attenuation level (dB) is also displayed here, when using the remote control unit.

⑤ A-B repeat indicator (A⊂⊃B)

Illuminates when the A-B repeat mode is activated by pressing the A-B repeat button.

- " A⊂⊃ " illuminates when the A-B repeat button is pressed once.
- "A⊂⊃B" illuminates when the A-B repeat button is pressed again.
- If the A-B repeat button is pressed a third time, this indicator goes out to show that A-B repeat has been cancelled.

⑥ Repeat/programmed repeat indicator (P⊂⊃)

The repeat indicator (⊂⊃) illuminates when the repeat mode is activated for an entire disc or a program and goes out when repeat is switched off.
If the numeric buttons are used to specify the number of repeat cycles, the (P⊂⊃) indicator illuminates. If the program repeat setting is cancelled, this indicator goes out.

⑦ Output level indicator (output level)

Normally, all bars are illuminated. When the digital volume attenuation function is activated using the remote control unit (included), bars will go out to show the attenuated volume level.

⑧ Music scan indicator (M.scan)

Illuminates when the music scan button (on the remote control unit) is pressed and goes out when the music scan play is cancelled.

⑨ Auto space indicator (A.space)

Illuminates when the auto space button is pressed to activate the auto space mode and goes out when the button is pressed again to cancel the auto space mode.

⑩ Play indicator (▶)

Illuminates when the play mode is activated and goes out when play is stopped.

⑪ Pause indicator (❚❚)

Illuminates when the pause mode is activated and goes out when the pause mode is cancelled.

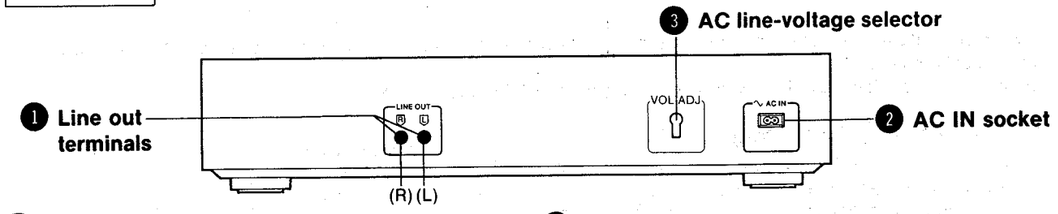
⑫ Disc indicator (disc)

Flashes on and off when the disc holder is opening or closing.
Illuminates when a disc is in the holder (if power is on) and the disc holder is closed.

⑬ Overflow indicator (≫)

≫ Illuminates when a disc containing more than 20 tracks is inserted.
> Flashes on and off when track number 21 or higher is played.
(At this time, the illuminated borders around the numbers in the music matrix go out.)

Rear panel



① Line out terminals (LINE OUT)

These are the audio output terminals.

- Connect the LINE OUT terminals to the CD, AUX or TAPE PLAYBACK terminals on your amplifier or receiver.
- Do not connect the LINE OUT terminals to the PHONO terminals of your amplifier or receiver.

② AC IN socket (∿ AC IN)

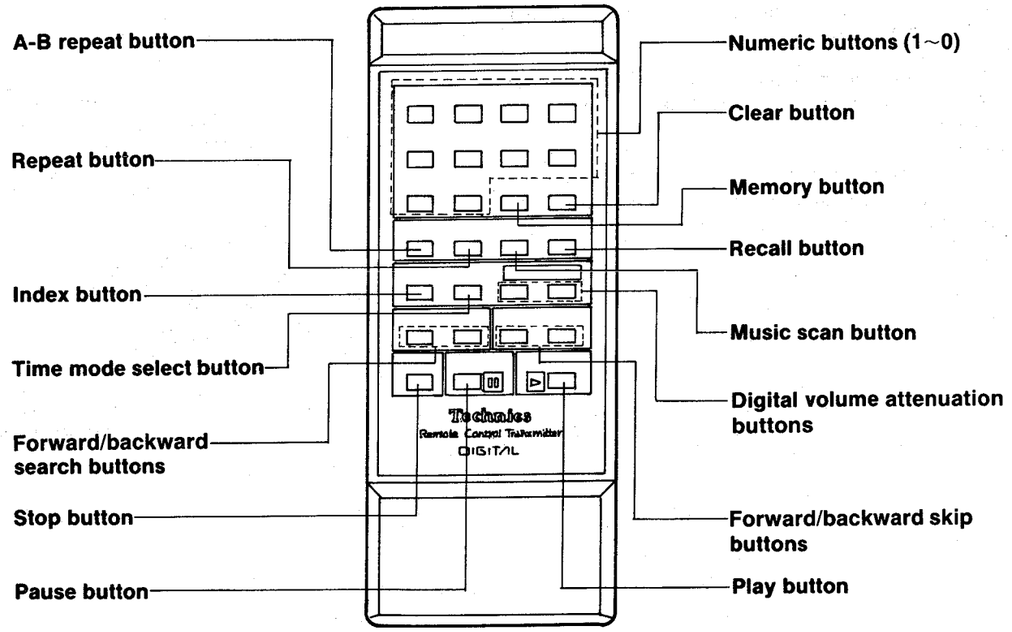
Connect to an AC outlet on the wall or on the rear panel of your amplifier or receiver.

③ AC line-voltage selector

The AC line-voltage selector is for [XA], [PA], [PE], [PC], [XB] areas only.

Remote control unit

EUR64555 ..... For U.S.A. and Canada (Black Type)
EUR64556 ..... For others (Black Type)
EUR64557 ..... For others (Silver Type)

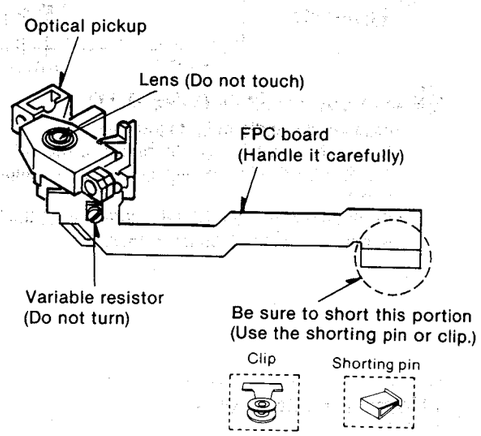


■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

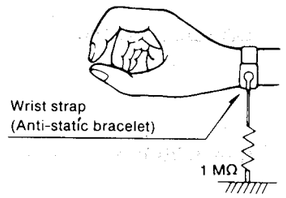
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. **(FPC board)**
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board. **(FPC board)**
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

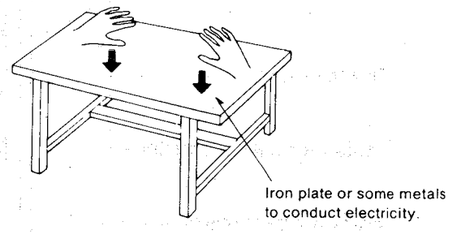


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

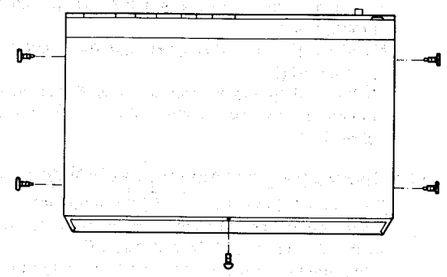




■ DISASSEMBLY INSTRUCTIONS

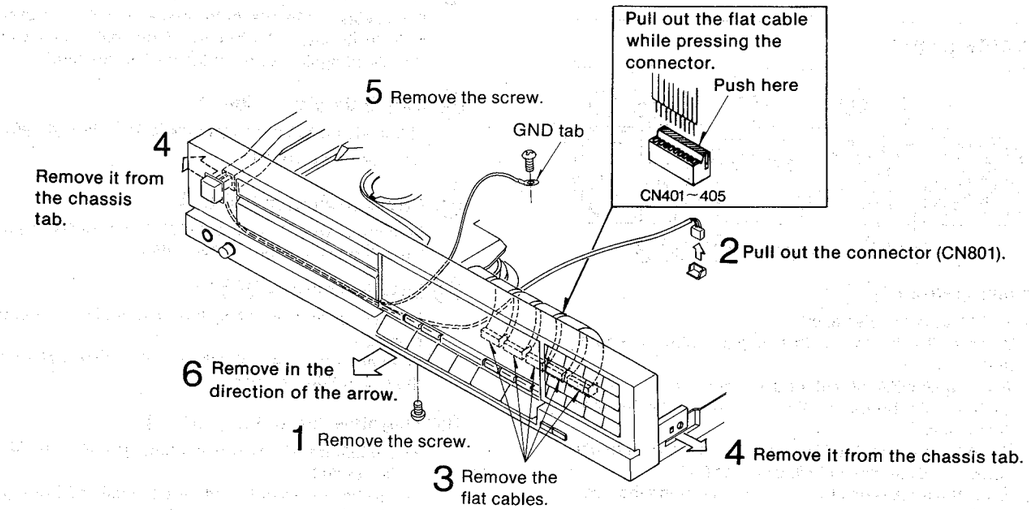
CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

Ref. No. 1	How to remove the cabinet
Procedure 1	•Remove the 5 screws.

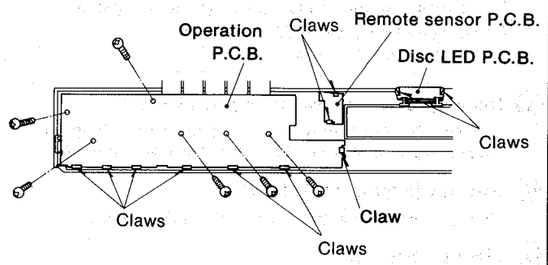


Note: When doing the job, Lock the lock shaft at the bottom of the unit. (see page 3)

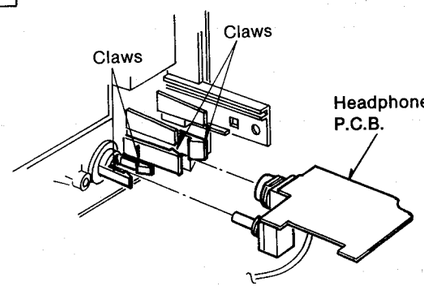
Ref. No. 2	How to remove the front panel
Procedure 1 → 2	• Remove in the numerical order shown.


Pull out the flat cable while pressing the connector.
Push here
CN401～405
5 Remove the screw.
GND tab
4
Remove it from the chassis tab.
2 Pull out the connector (CN801).
6 Remove in the direction of the arrow.
1 Remove the screw.
3 Remove the flat cables.
4 Remove it from the chassis tab.

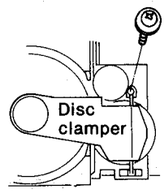
Ref. No. 3	How to remove the operation P.C.B.
Procedure 1 → 2 → 3	1. Release the claws of the remote sensor and disc LED P.C.B. 2. Remove the 6 screws. 3. Release the claws of the operation P.C.B.



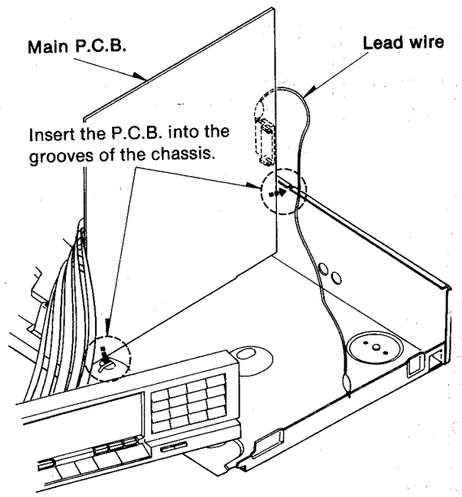
Ref. No. 4	How to remove the headphones P.C.B.
Procedure 1 → 2 → 4	• Release the 4 claws.



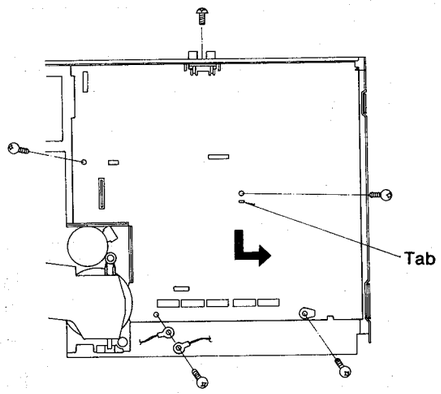
Ref. No. 6	How to remove the disc clamper
Procedure 1 → 6	• Remove the screw.



Notes:
1. Be sure to connect the P.C.B. ground terminal (Line out terminal) and the chassis with a lead wire.
2. Connect the ground wire of the loading base to the chassis.



Ref. No. 5	How to remove the main P.C.B.
Procedure 1 → 2 → 5	1. Remove the 5 screws. 2. Lift the P.C.B. to remove it from the chassis tab. 3. Remove in the direction of the arrow.

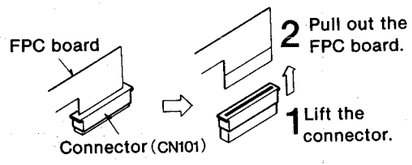


How to check the main P.C.B.

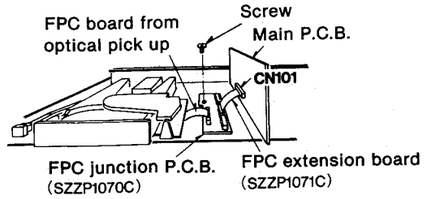
• When checking the soldered surface of the main P.C.B. and replacing the parts, do as shown.

1. Remove the FPC board.

Caution: Insert the shorting pin into the FPC board in order to prevent breakdown of the laser diode. (See page 10)



2. Mount the FPC junction P.C.B. **(SZZP1070C) on the chassis. (Do the job as shown by using the main P.C.B. setscrew.)**
3. Connect the FPC board from the optical pickup to the FPC junction P.C.B.
4. Connect the FPC extension board (SZZP1071C) to the FPC junction P.C.B. and CN101 of the main P.C.B.

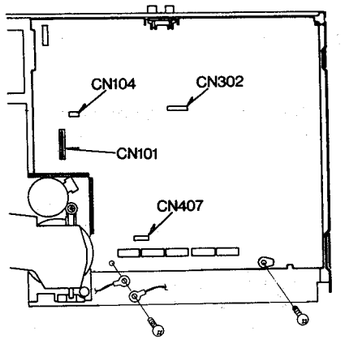


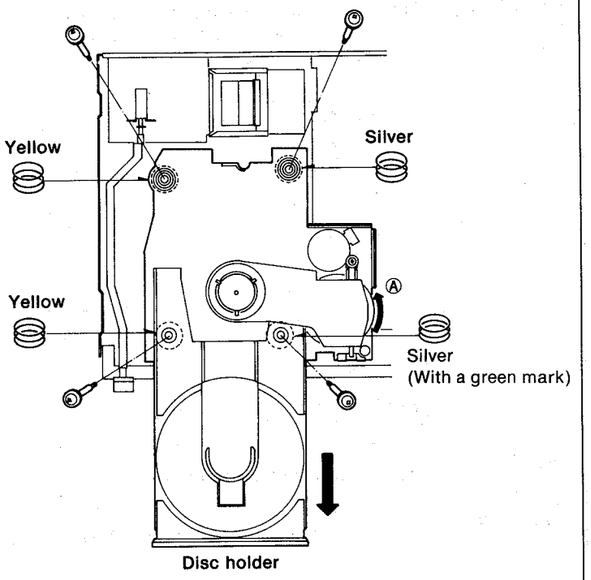
Ref. No. 7	How to remove the loading base
Procedure 1 → 2 → 7	**Refer to the optical pickup handling precautions (See page 7).**

1. Turn the drive gear in the direction of the arrow Ⓐ, and shift the disc holder forward.
2. Remove the 4 screws.

Caution: Note the color of each spring, they must be reinstalled in their original positions.

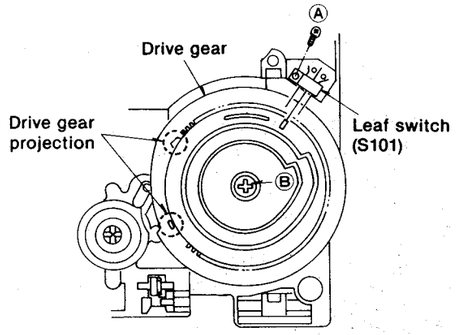
3. Pull out the 3 connectors (CN104, CN302, CN407) and remove the screw and the Ground terminal.
4. Remove the FPC board (CN101).





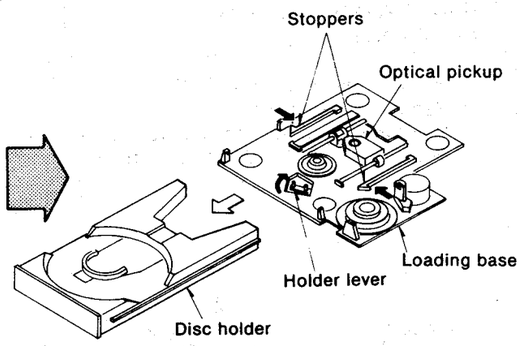
Ref. No. 8	How to remove the disc holder (disc tray)
Procedure 1 → 2 → 6 → 8	

• **Set the drive gear as shown below.** (Turn it completely to the right, then turn it to the left by about 20° so that the drive gear teeth or projection will not touch the rack of the disc holder.)



• **To remove the drive gear**
Remove the screw Ⓐ of the leaf switch (S101), then remove the drive gear setscrew Ⓑ.

1. Push the holder lever backward, (From underneath the loading base.)
2. Pull the disc holder and bend the 2 claws of the disc holder stopper of the loading base toward the optical pickup.
3. Further pull out the disc holder to remove it.



• **Caution for fitting**
When fitting the disc holder, make the drive gear as shown on the left, and then insert the disc holder along the guide of the loading base. After inserting the disc holder cmpletely, turn the drive gear to the right completely.

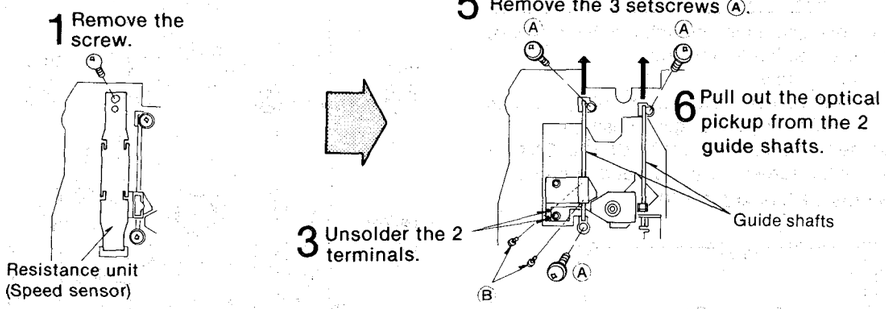
Ref. No. 9 — How to remove the optical pick up

Procedure 7 → 8 → 9

- Remove in the numerical order shown.

Note: Lock the lock shaft at the bottom of the unit. (See page 6.)

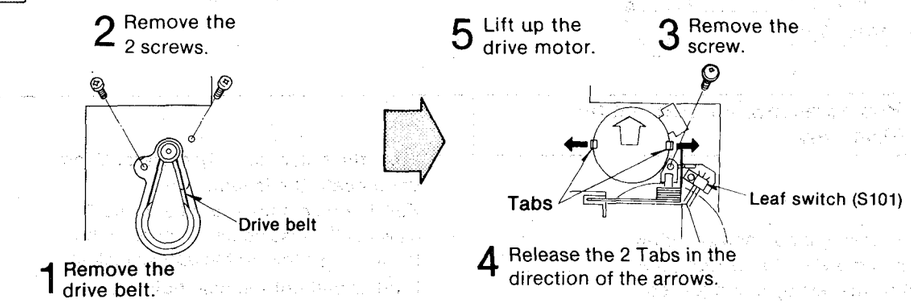
Refer to the optical pickup handling precautions (See page 7).


1 Remove the screw.
Resistance unit (Speed sensor)
2 Remove the resistance unit.
3 Unsolder the 2 terminals.
4 Remove the 2 screws Ⓑ. (Underneath)
5 Remove the 3 setscrews Ⓐ.
6 Pull out the optical pickup from the 2 guide shafts.
Guide shafts
A
B

Ref. No. 10 — How to remove the drive motor

Procedure 7 → 10

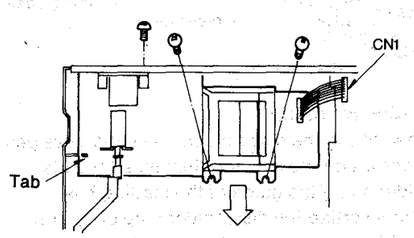
- Remove in the numerical order shown.


2 Remove the 2 screws.
Drive belt
1 Remove the drive belt.
5 Lift up the drive motor.
3 Remove the screw.
Tabs
Leaf switch (S101)
4 Release the 2 Tabs in the direction of the arrows.

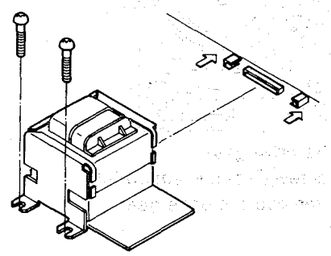
Ref. No. 11 — How to remove the power transformer

Procedure 7 → 11

1. Remove the connector (CN1).
2. Remove the 3 screws.
3. Remove it from the chassis tab.
4. Remove in the direction of the arrow.



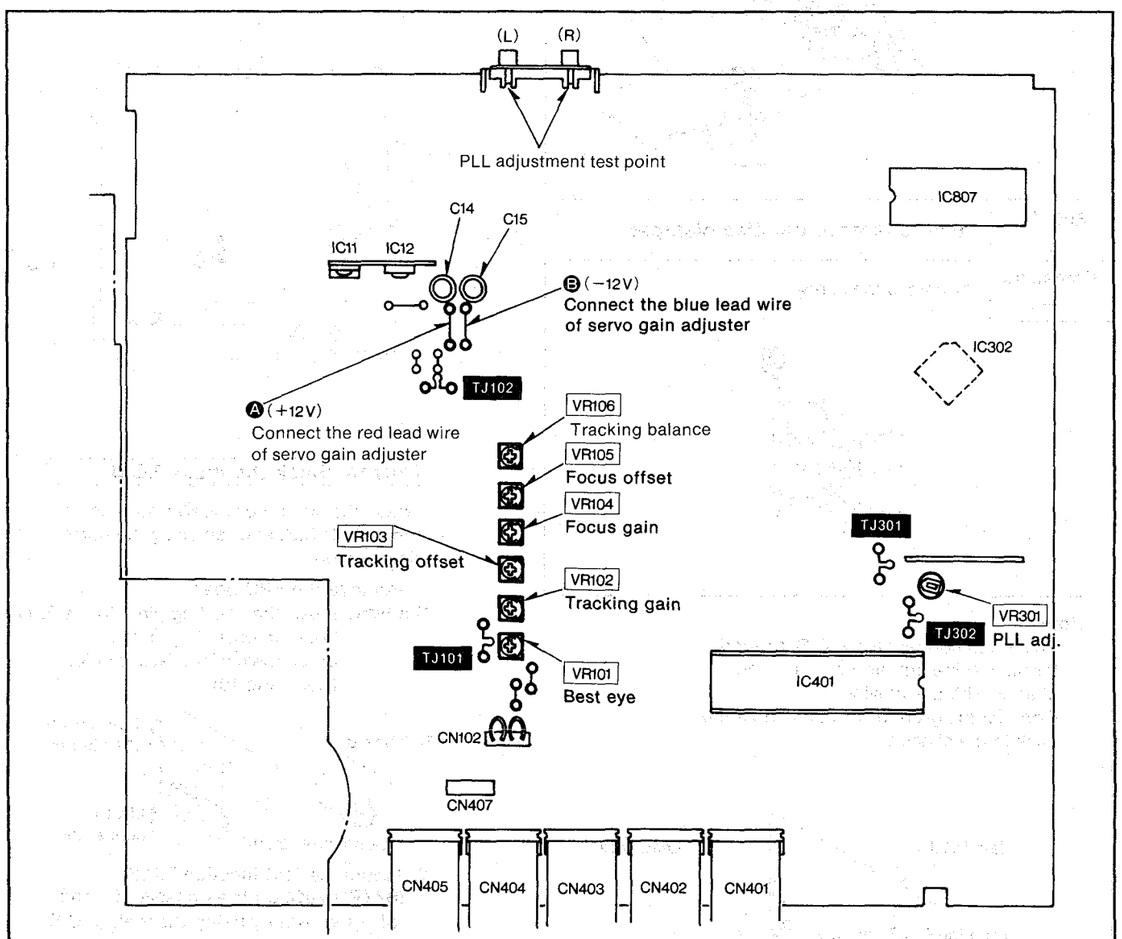
Note: When replacing the power transformer, do as shown.



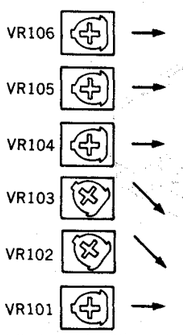
■ MEASUREMENTS AND ADJUSTMENTS

Caution:
- It is very dangerous to look at or touch the laser beam. (Laser radiation is invisible.) With the unit turned "on", laser radiation is emitted from the pickup lens. Avoid exposure to the laser beam , especially when performing adjustments.

ADJUSTMENT POINTS



- **Temporary Setting of Each VR**



ELECTRICAL ADJUSTMENT

Measuring Instruments and Special Tools

- Servo gain adjuster (SZZP1017F)
- Test discs
  Test disc(SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
  Black band disc (SZZP1057C)
- Ordinary disc
- Two-channel oscilloscope (with trigger) of 30MHz or over
- Low frequency oscillator
- Conversion connector(SZZP1032F)

Adjustment Procedure

Step 1: Remove the cabinet. (Refer to page 8.)

Step 2: Make the temporary setting of each VR . (Refer to page 12.)

Step 3: Best eye (PD balance) adjustment. (Refer to page 14.)

Step 4: Connect the servo gain adjuster. (Refer to page 13.)

Step 5: Focus gain adjustment. (Refer to page 14.)

Step 6: Tracking gain adjustment. (Refer to page 14.)

Step 7: Temporary adjustment of focus and tracking offset.(Refer to page 15.)

Step 8: Focus offset adjustment. (Refer to page 15.)

Step 9: Tracking offset adjustment. (Refer to page 15.)

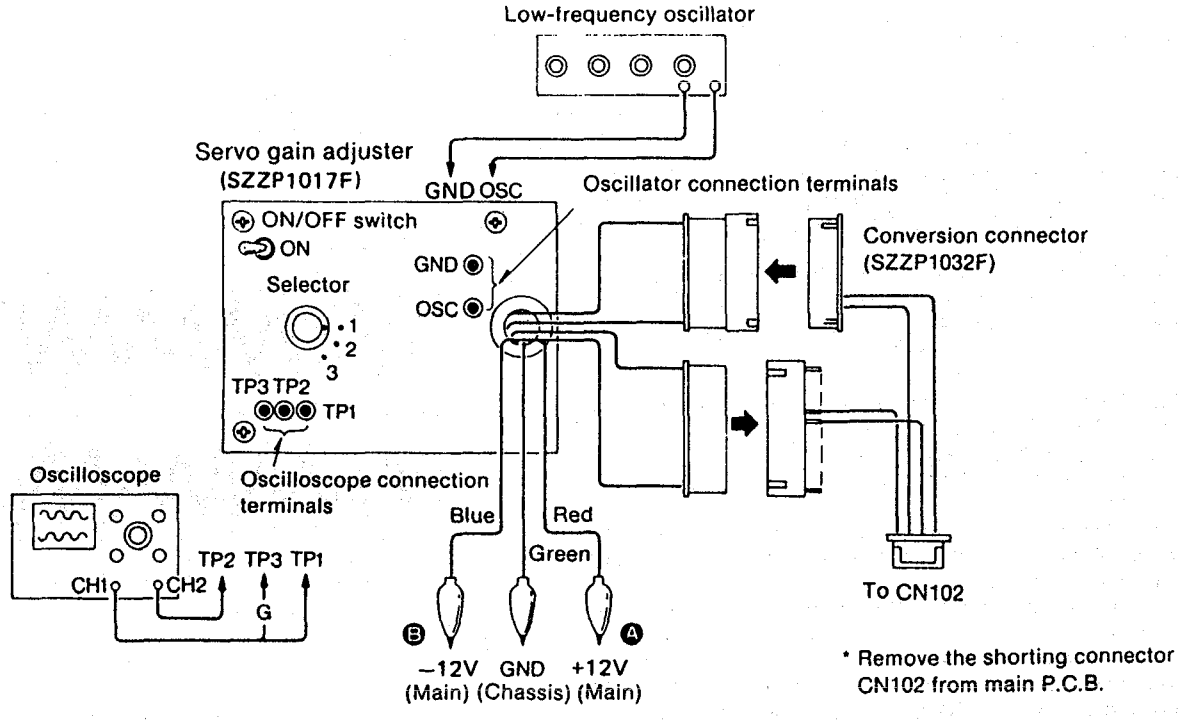
Step 10: Connect the servo gain adjuster. (Refer to page 13.)

Step 11: Tracking offset balance adjustment.(Refer to page 15.)

Step 12:PLL adjustment. (Refer to page 16.)

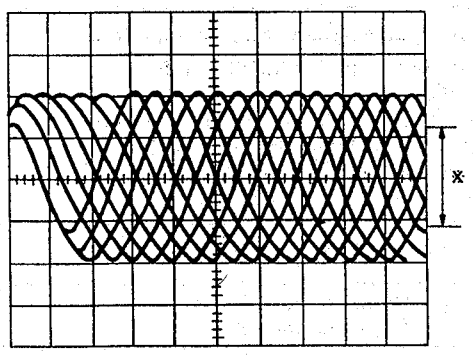
Step 13: Check of operation after adjustment. (Refer to page 16.)

Connection of Servo Gain Adjuster



BEST EYE(PD BALANCE) ADJUSTMENT

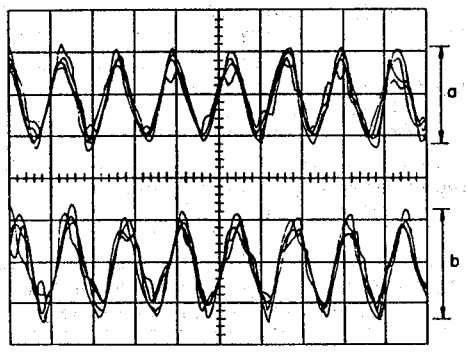
1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5μsec.
INPUT.....AC
2.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
3.Set the player to the play mode.
4.Adjust **VR101** so that the amplitude of the eye pattern of the RF signal is maximized.
5.Turn **OFF** the power switch of the player.



*Most stretched eye pattern

FOCUS GAIN ADJUSTMENT

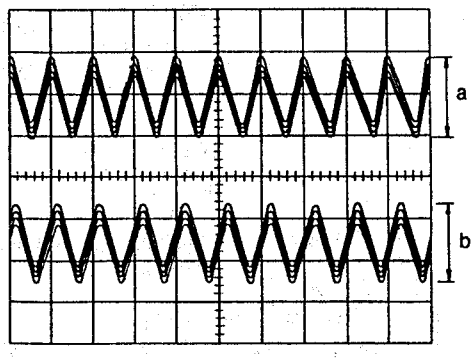
1.Connect the servo gain adjuster.(Refer to page 13.)
2.Set the selector switch of the servo gain adjuster to **2** and the ON-OFF switch to **ON.**
3.Set the low frequency oscillator to a frequency of **750Hz** and an output voltage of **100mVp-p.** Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
4.Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster.(TP3 is the ground terminal.)
Oscilloscope setting:VOLT.....200mV(both channels)
SWEEP.....1msec.
INPUT.....DC
5.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
6.Set the player to the play mode.
7.Shift the selector switch of the servo gain adjuster from *"2"* to *"3"*.
8.The **750Hz** signals will be displayed on the oscilloscope. Adjust **VR104** until the waveform amplitudes of both channels are equal.
9.Shift the selector switch of the servo gain adjuster from *"3"* to *"2"*.
10.Turn **OFF** the power switch of the player.



* Make a=b

TRACKING GAIN ADJUSTMENT

1.Set the low frequency oscillator to a frequency of **1.0kHz** and an output voltage of **100mVp-p.** Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
2.Connect CH1 and CH2 of the oscilloscope to **TP1** and **TP2** of the servo gain adjuster.(TP3 is the ground terminal.)
Oscilloscope setting:VOLT.....200mV(both channels)
SWEEP.....1msec.
INPUT.....DC
3.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
4.Set the player to the play mode.
5.Shift the selector switch of the servo gain adjuster from *"2"* to *"1"*.
6.The **1.0kHz** signals will be displayed on the oscilloscope. Adjust **VR102** until the waveform amplitudes of both channels are equal.
7.Shift the selector switch of the servo gain adjuster from *"1"* to *"2"*.
8.Turn **OFF** the power switch of the player.
9.Disconect the servo gain adjuster, and re-insert the shorting connector CN102 to its original position.



*Make a=b

TEMPORARY ADJUSTMENT OF FOCUS AND TRACKING OFFSET

(Temporary adjustment of focus offset)

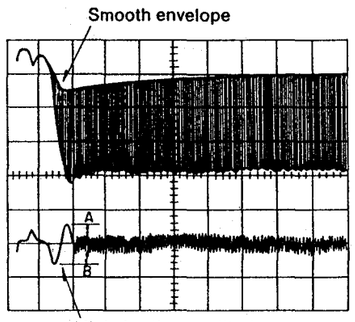
1.Connect CH1 of the oscilloscope to **TJ102** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....100mV
SWEEP.....5msec.
INPUT.....DC
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.After the player reads TOC, adjust **VR105** so that the voltage waveform center on the oscilloscope is **0mV.**

(Temporary adjustment of tracking offset)

1.Connect CH1 of the oscilloscope to **TJ101** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....100mV
SWEEP.....5msec.
INPUT.....DC
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.After the player reads TOC, adjust **VR103** so that the voltage waveform center on the oscilloscope is **0mV.**

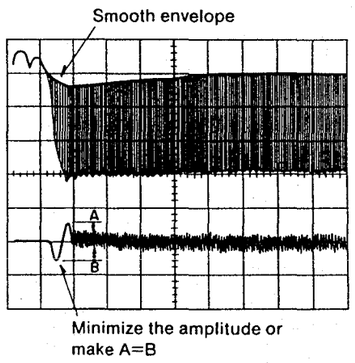
FOCUS OFFSET ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ102** (+) and **TJ302** (-)of the main P.C.B.
Oscilloscope setting:
VOLT.....200mV(CH1) 100mV(CH2)
SWEEP.....0.5msec.
INPUT.....AC(CH1),DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR105**, so that the waveform around the triggering point becomes as shown in the illustration.



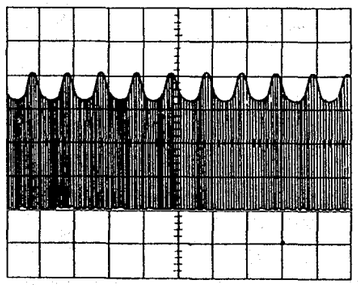
TRACKING OFFSET ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Connect CH2 of the oscilloscope to **TJ101** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:
VOLT.....200mV(CH1) 100mV(CH2)
SWEEP.....0.5msec.
INPUT.....AC(CH1), DC(CH2)
MODE.....NORM
(Triggering via CH1)
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1057C).
3.Set the player to the play mode.
4.Check the waveform of CH1 and CH2 on the oscilloscope and adjust **VR103**, so that the waveform around the triggering point becomes as shown in the illustration.



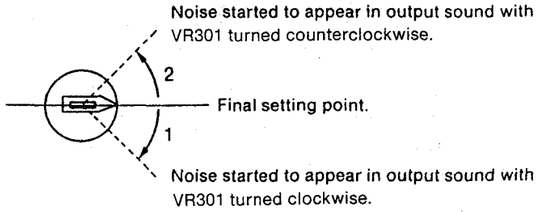
TRACKING OFFSET BALANCE ADJUSTMENT

1.Connect the servo gain adjuster.(Refer to page 13.)
2.Set the selector switch of the servo gain adjuster to **2** and the ON/OFF switch to **ON.**
3.Set the low frequency oscillator to a frequency of **1kHz** and an output voltage of **200mVp-p**. Then connect the oscillator to **OSC** (+) and **GND** (-) terminals of the servo gain adjuster.
4.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-)of the main P.C.B.
Oscilloscope setting:VOLT.....500mV
SWEEP.....0.5msec.
INPUT.....AC
5.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
6.Set the player to the play mode.
7.Shift the selector switch of the servo gain adjuster from *"2"* to *"1"*.
8.Adjust **VR106**, so that the output waveform is as shown (jitter is minimized).
9.Shift the selector switch of the servo gain adjuster from *"1"* to *"2"*.
10.Turn **OFF** the power switch of the player.
11.Disconnect the servo gain adjuster, and re-insert the shorting connector CN102 to its original position.

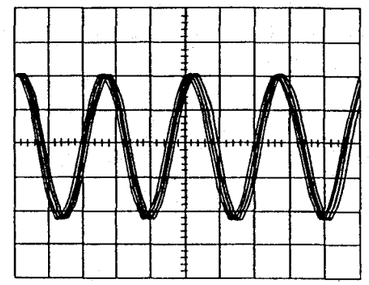


PLL ADJUSTMENT

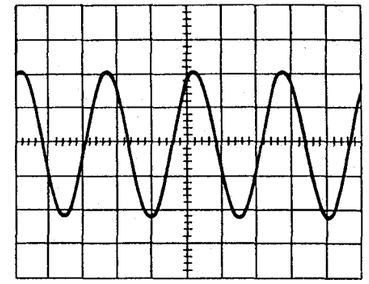
1.Connect CH1 of the oscilloscope to the **LINE OUT terminal** (either of Lch or Rch) and **ground.**
Oscilloscope setting:VOLT.....1V
SWEEP.....1msec.
INPUT.....DC
2.Turn **ON** the power switch of the player and insert the test disc(SZZP1054C).
3.Play **track No.6 (wedge 0.7mm)** of the test disc.
4.Check the waveform displayed on the oscilloscope and adjust **VR301** in the following steps.
Step 1. Turn **VR301** clockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 2. Turn **VR301** counterclockwise slowly and observe the point at which the waveform on the oscilloscope begins to be disturbed.
Step 3. Set **VR301** in the middle between the points observed in the above steps *"1"* and *"2"*.



● NG



● OK



CHECK OF PLAY OPERATION AFTER ADJUSTMENT

Check of skip search
1.Play an ordinary disc.
2.Press the skip button and verify skip search operation (forward and reverse).

Check of manual search
1.Play an ordinary disc.
2.Press the manual search button and verify that smooth manual search can be performed at low and high speeds (forward and reverse).

Check of playability
1.Play the test disc (SZZP1054C).
2.Play the track No.6 (wedge 0.7mm) and verify that there is no skip sound or noise.
3.Play the track No.13 (black dot 0.7mm) and verify that there is no skip sound or noise.

OPTICAL PICKUP ADJUSTMENT

Measuring Instruments and Special Tools

- Two-channel oscilloscope (with trigger) of 30MHz or over
- Test discs
  Test disc (SZZP1014F) old or new type
  Inspection test disc (SZZP1054C)
  Uneven disc (SZZP1056C)
- Hexagonal wrench (SZZP1044C....1.5mm)
- Screw lock paint (RZZ0L01)

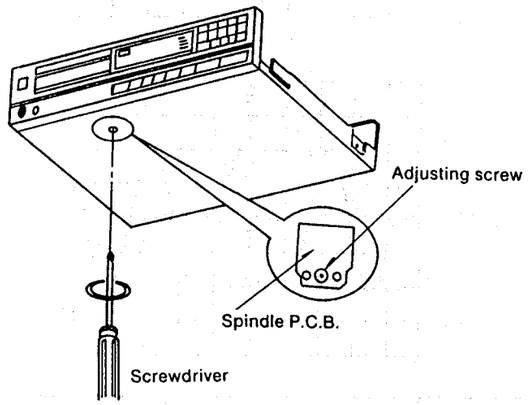
Adjustment Procedure

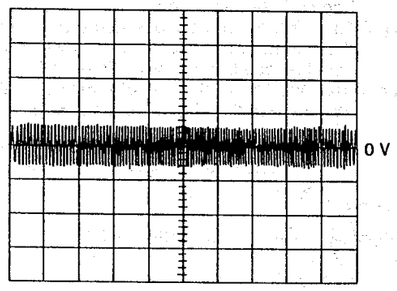
- If the optical pickup is replaced, adjust it according to the following steps.

Step 1: Assemble the set to make it ready for power ON check.
↓
Step 2: Make the temporary setting of each VR.(Refer to page 12.)
↓
Step 3: Turntable height adjustment. (Refer to page 17.)
↓
Step 4: Mechanical adjustment. (Refer to page 17.)
↓
Step 5: Electrical adjustment. (Refer to page 13.)

TURNTABLE HEIGHT ADJUSTMENT

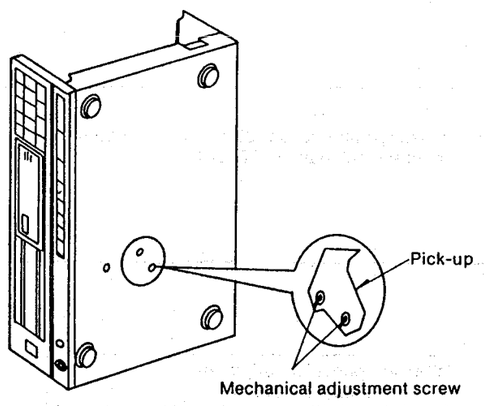
1.Connect CH1 of the oscilloscope to **TJ102** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....100mV
SWEEP.....5msec.
INPUT.....DC
2.Set the oscilloscope to DC zero balance.
3.Turn **ON** the power switch of the player and insert a test disc (SZZP1014F or SZZP1054C).
4.Set the player to the play mode.
5.Turn the **adjusting screw** at the bottom of the spindle motor drive P.C.B. with a flat screwdriver so that the waveform is balanced at **0 ± 50mV.**
6.Turn **OFF** the power switch of the player.
7.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screw.

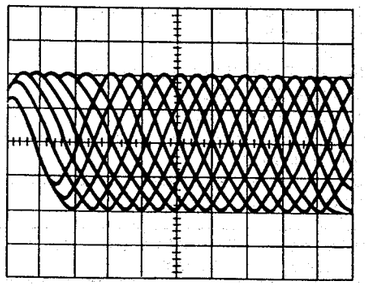




MECHANICAL ADJUSTMENT

1.Connect CH1 of the oscilloscope to **TJ301** (+) and **TJ302** (-) of the main P.C.B.
Oscilloscope setting:VOLT.....200mV
SWEEP.....0.5µsec.
INPUT.....AC
2.Turn **ON** the power switch of the player and insert the test disc (SZZP1056C).
3.Using the manual search buttons,move the pickup so that the mechanical adjustment screws line up with the adjustment holes in the bottom panel.
4.Monitoring the RF signal on the oscilloscope, adjust the **two adjusting screws** alternately so that the vertical fluctuation(jitter) of the RF signal is minimized and the amplitude of the eye pattern is maximized.
5.Turn **OFF** the power switch of the player.
6.After the adjustment, apply **screw lock paint(RZZ0L01)** to the adjusting screws.





Note: The mechanical adjustment screws have been already locked with screw lock paint at the factory. It might be hard to turn them.

■ RESISTORS & CAPACITORS

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

Numbering System of Resistor

Example

ERD	25	F	J	102
Type	Wattage	Shape	Tolerance	Value
ERX	2	AN	J	471
Type	Wattage	Shape	Tolerance	Value 47x10¹ (ohm)

Numbering System of Capacitor

Example

ECKD	1H	102	Z	F
Type	Voltage	Value	Tolerance	Peculiarity
ECEA	50	M		330
Type	Voltage	Peculiarity		Value (33x10⁰ microfarad)

Resistor Type	Wattage	Tolerance
ERD : Carbon ERG : Metal Oxide ERX : Metal Film ERQ : Fuse Type Metal ERD□ L : Carbon (chip) ERO□ K : Metal Film (chip) ERC : Solid	10 : 1/8W 12 : 1/2W 25 : 1/4W 1A : 1W 18 : 1/8W S2 : 1/4W S1 : 1/2W 2F : 1/4W 50 : 1/2W 2A : 2W	J : ±5% F : ±1% G : ±2% K : ±10%

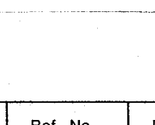
Capacitor Type	Voltage	Tolerance
ECE : Electrolytic ECCD : Ceramic ECKD : Ceramic ECQM : Polyester ECQP : Polyproylene ECG : Ceramic ECEA□□□N: Non Polar Electrolytic QCU□ : Ceramic (Chip Type) ECUX : Ceramic (Chip Type) ECF : Semiconductor EECW : Liquid electrolyte double layer capacitor	0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1H : 50V 1V : 35V 50 : 50V 05 : 50V 2H : 500V 2A : 100V 1 : 100V KC: 400V AC KC: 125VAC (UL) 1J : 63V	C : ±0.25pF J : ±5% K : ±10% Z : +80% –20% P : +100% –0% M : ±20% D : ±0.5pF G : ±2%

Ref. No.	Part No.
RESISTORS	
R11, R12	ERDS2TJ102
R13	ERDS2TJ222
R14	ERDS2TJ822
R102	ERDS2TJ222
R103	ERDS2TJ273
R104	ERDS2TJ153
R105	ERDS2TJ182
R106	ERDS2TJ473
R107	ERDS2TJ274
R108	ERDS2TJ101
R109, R110	ER0S2TKF4702
R111, R112	ERDS2TJ274
R113, R114	ER0S2TKF4702
R115	ERDS2TJ102
R116	ERDS2TJ472
R117	ERDS2TJ270
R118	ERDS2TJ3R3
R119	ERDS2TJ101
R120	ERDS2TJ270
R121	ERDS2TJ3R3
R122	ERDS2TJ153
R123	ERDS2TJ101
R124	ERDS2TJ103
R125	ERDS2TJ104
R126	ERDS2TJ152
R127	ERDS2TJ682
R128	ERDS2TJ153
R129	ERDS2TJ224
R130	ERDS2TJ122
R131, R132	ERDS2TJ333
R133	ERDS2TJ102
R134	ERDS2TJ392
R135	ERDS2TJ102
R136	ERDS2TJ182
R137	ERDS2TJ681
R138	ERDS2TJ333
R139	ERDS2TJ222
R140	ERDS2TJ223
R141	ERDS2TJ153
R142	ERDS2TJ821
R143	ERDS2TJ474
R144	ERDS2TJ471
R145	ERDS2TJ270
R171	ERDS2TJ154
R172, R173	ERDS2TJ472
R174	ERDS2TJ223
R175	ERDS2TJ334
R176	ERDS2TJ473
R177	ERDS2TJ683
R178	ERDS2TJ332
R179	ERDS2TJ822
R180, R181	ERDS2TJ682
R182	ERDS2TJ822
R183, R184	ERDS2TJ152
R185	ERDS2TJ102
R186, R187	ERDS2TJ182
R188	ERDS2TJ102
R189	ERDS2TJ471
R190	ERDS2TJ120
R301	ERDS2TJ682
R302	ERDS2TJ104
R303	ERDS2TJ334
R304, R305	ERDS2TJ223
R306	ERDS2TJ102
R307	ERDS2TJ472
R308	ERDS2TJ471
R309	ERDS2TJ121
R401, R402	ERDS2TJ472
R403, R404	ERDS2TJ473
R405	ERDS2TJ152
R406, R407	ERDS2TJ103
R408, R409	ERDS2TJ103
R410, R411	ERDS2TJ472
R412, R413	ERDS2TJ472
R414, R415	ERDS2TJ472
R416	ERDS2TJ223
R417, R418	ERDS2TJ472
R420	ERDS2TJ473
R421	ERDS2TJ331
R422	ERDS2TJ394
R501, R502	ERJ8GEXK1R0
R503	ERJ8GEYJ223
R511, R512	ERJ8GEXK4R7V
R513	ERJ8GEXK4R7V
R601, R602	ERDS2TJ222
R603, R604	ERDS2TJ222
R801, R802	ER0S2TKG1101
R803, R804	ER0S2TKG1201
R805, R806	ER0S2TKG33R0
R807, R808	ER0S2TKG10R0
R809, R810	ER0S2TKG1001
R811, R812	ER0S2TKG3301
R821, R822	ERDS2TJ391
R823, R824	ERDS2TJ104
R825, R826	ERDS2TJ222
R827, R828	ERDS2TJ221
R831	ERDS2TJ272
R832	ERDS2TJ103
R837, R838	ERDS2TJ104
R845, R846	ERDS2TJ102
R851, R852	ERDS2TJ103
R853, R854	ERDS2TJ473
R855, R856	ERDS2TJ820
R857, R858	ERDS2TJ103
CAPACITORS	
C1, C2 ⚠	ECKD1H223PF
C3 ⚠	ECKD1H223PF
C4, C5	ECEA1EU102
C6, C7	ECEA1HU010
C8 ⚠	ECKD1H223PF
C11, C12	ECEA1CU222
C13, C14	ECEA0JS221
C15	ECEA1EU470
C18	ECEA1HU470
C19, C20	ECEA1CU470
C21	ECFR1E104ZF
C101	ECQM1H104JZ
C102	ECEA1CU100
C103	ECEA1HN2R2S
C104	ECQM1H103JZ
C105	ECQM1H224KVW
C106	ECEA1CU100
C107, C108	ECEA1HNR22BV
C109	ECEA1HN2R2S
C110	ECQM1H122JZ
C111	ECQM1H473JZ

Ref. No.	Part No.	Ref. No.	Part No.	Ref. No.	Part No.
C112	ECFR1E104ZF	C145	ECEA1AU220	C405	ECQM1H103JZ
C113	ECQM1H153JZ	C146	ECEA0JU470	C406	ECEA1HUR22
C114	ECEA1HN3R3S	C147, C148	ECKD1H102KB	C407	ECFD1H104ZF
C115	ECFR1E104ZF	C149	ECQM1H153JZ	C408	ECKD1H102KB
C119	ECEA0JU101	C150	ECQM1H102JZ	C501	ECEV1EV330
C120	RCBS1C103MYY	C151	ECQM1H153JZ	C502	ECEV1EV010
C121	ECFR1E104ZF	C152, C153	ECQM1H104JZ	C504	ECUV1E273KB
C122, C123	ECKD1H102KB	C154	ECKD1H471KB	C506	ECUV1H152KB
C124	ECKD1H681K	C155	ECKD1H103PF	C507	ECUV1E104ZF
C127	ECCD1H220K	C156	ECKD1H681K	C511, C512	ECEA1EN470S
C128	ECEA1HS0R1	C301	ECEA1HN2R2S	C513	ECEA1EN470S
C129	ECEA1HU010	C302	ECFF1H103KR	C601	RCBS1C103MYY
C130	ECQV1H104JZ	C303, C304	ECQM1H104JZ	C602	RCBS1H220JCY
C131, C132	ECEA1HU100	C305	ECCD1H220K	C803, C804	CQS2B391JCF
C133	ECEA1HNR33BV	C306	ECCD1H070CC	C805, C806	ECQM1H103JZ
C134	ECKD1H182KB	C307	ECFR1E104ZF	C807, C808	RBP1CN220CT
C135	ECKD1H682KB	C308	ECKD1H471KB	C809, C810	ECKD1H102KB
C136	ECQM1H333JZ	C309	ECQV1H104JZ	C811, C812	ECEA0JU470
C137	ECKD1H221KB	C310	ECCD1H070CC	C813, C814	REC1C221M0
C138	ECEA1HU010	C311, C312	ECCD1H470K	C815, C816	ECEA1CN220BV
C139	ECEA1CN220BV	C313, C314	ECCD1H470K	C818	ECKD1H471KB
C140	ECKD1H681K	C401	ECEA0JU470	C851, C852	ECKD1H103PF
C141	ECFF1H103KR	C402	ECFR1E104ZF	C853, C854	ECKD1H332KB
C142, C143	ECKD1H101KB	C403	ECKD1H103PF	C857, C858	ECEA1CU100
C144	ECKR1H222KB	C404	ECFD1H104ZF	C859, C860	ECKD1H223PF
				C901 ⚠	ECKDKC103PF2

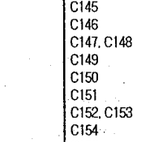
• Terminal guide of IC's, transistors and diodes

AN6552F	8 Pin
SVIM5218P	
SVILM833	
AN6554	14 Pin
MN4053B	16 Pin
MN6030	22 Pin
SVIPCM54KP	28 Pin
MN15283PDP	64 Pin



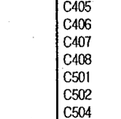
MN1550PDT	18 Pin
MN4416S-12	24 Pin
AN8290S	
AN8370S	42 Pin

MN6618A	42 Pin
MN6617	84 Pin

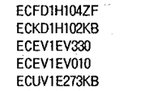


SVIM51953BL

SVIBA6218

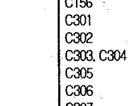


AN78M12, AN79M12
AN78M05



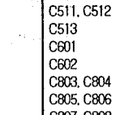
AN79N05

SVIFU15



EHDGA1243

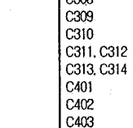
SVIAF822



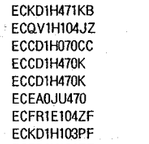
2SD973, 2SB793

2SA1309

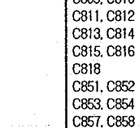
UN4212, UN1231



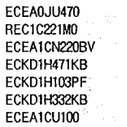
SVDERA15, MA165



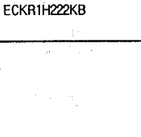
MA4082, MA4330
MA4056



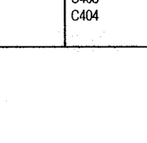
SVDSLR-54MW4
LN66



MA154WA



MA154WK



■ REPLACEMENT PARTS LIST

Notes: * Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
* Bracketed indications in Ref. No. columns specify the area.
Parts without these indications can be used for all areas.

Ref. No.	Part No.	Description
INTEGRATED CIRCUITS		
IC1	AN78M12	I.C., REGULATOR
IC2	AN79M12	I.C., REGULATOR
IC4, IC5	SVIFU15	I.C.PROTECTOR
IC11	AN78M05	I.C., REGULATOR
IC12	AN79N05	I.C., REGULATOR
IC101	AN8370S	I.C., SERVO
IC102, IC103	AN6554	I.C., OPERATION AMP.
IC106	MN4053B	I.C., SWITCHING
IC301	MN6617	I.C., SIGNAL PROCESSING
IC302	MN6618A	I.C., DIGITAL FILTER
IC303	SVICXK5816M	I.C., 16K RAM
IC304	EHDGA1243	I.C., PLL
IC401	MN15283PDP-1	I.C., SYSTEM CONTROL
IC402	SVIM51953BL	I.C., RESET
IC403	BA6218	I.C., MOTOR DRIVE
IC501	AN8290S	I.C., SPINDLE DRIVE
IC601	MN1550PDT	I.C., DATA PROCESSING
IC602 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	SVIHCMD07E	I.C., REMOTE RECEIVER
IC602 (M, MC)	SVIHCMD09M	I.C., REMOTE RECEIVER
IC801, IC802	SVIAF822	I.C., FILTER
IC803, IC804	SVILM833NA	I.C., OPERATION AMP.
IC805	SVILM833NA	I.C., OPERATION AMP.
IC806	AN6552F	I.C., OPERATION AMP.
IC807	SVIPCM54JP-V	I.C., D/A CONVERTER
IC851	M5218P	I.C., OPERATION AMP.
TRANSISTORS		
Q11	2SC1846-R	TRANSISTOR
Q12	2SA885Q	TRANSISTOR
Q13	2SA1309Q	TRANSISTOR
Q101	2SC1846-R	TRANSISTOR
Q102	2SA885Q	TRANSISTOR
Q103	2SD973A-QRS	TRANSISTOR
Q104	2SB793A-QRS	TRANSISTOR
Q105	2SD973A-QRS	TRANSISTOR
Q106	2SB793A-QRS	TRANSISTOR
Q110	2SD637	TRANSISTOR
Q408, Q409	UN4212	TRANSISTOR
Q411, Q412	UN4212	TRANSISTOR
Q413, Q415	UN4212	TRANSISTOR
Q416	UN4212	TRANSISTOR
Q801	2SA1309Q	TRANSISTOR
DIODES		
D1, D2 ⚠	SVDERA15-04T	RECTIFIER
D3, D4 ⚠	SVDERA15-04T	RECTIFIER
D5, D6 ⚠	SVDERA15-04T	RECTIFIER
D7, D8 ⚠	SVDERA15-04T	RECTIFIER
D9 ⚠	SVDERA15-04T	RECTIFIER
D11, D12	MA4082M	DIODE
D13	MA4330L	DIODE
D14	MA4082M	DIODE
D15, D16 ⚠	SVD1SR35200A	RECTIFIER
D17, D18 ⚠	SVD1SR35200A	RECTIFIER
D101, D102	MA165	DIODE
D103, D401	MA165	DIODE
D417, D418	MA165	DIODE
D501	MA153	DIODE
D601, D602	MA165	DIODE
D603, D604	MA165	DIODE

Ref. No.	Part No.	Description
D605, D606	MA165	DIODE
D607, D608	MA165	DIODE
D610, D611	MA165	DIODE
D612, D613	MA165	DIODE
D614	MA165	DIODE
D641, D642	SVDSLR-54MW4	L.E.D
D643	SVDSLR-54MW4	L.E.D
D801, D802	MA4056-M	DIODE
D803	MA165	DIODE
HALL ELEMENTS		
H501, H502	0H-001	HALL ELEMENT
VARIABLE RESISTORS		
VR101	EVND3AA00B53	V.R., 5KΩ(B)
VR102, VR103	EVND3AA00B14	V.R., 10KΩ(B)
VR104, VR105	EVND3AA00B14	V.R., 10KΩ(B)
VR106	EVND3AA00B53	V.R., 5KΩ(B)
VR301	EVN38CA00B13	V.R., 1KΩ(B)
VR851	EVUN1A017A15	V.R., 100KΩ(A)
COILS AND TRANSFORMERS		
L301	ELEPG2R7MA	COIL
L501	SLQDNL100KT	COIL
L851, L852	ELEPG1R2MA	COIL
T1 ⚠ (M, MC)	SLTD1133U-1	POWER TRANSFORMER
T1 ⚠ (XL)	SLTD54JE49E	POWER TRANSFORMER
T1 ⚠ (EK, XA, XB) (PA, PE, PC)	SLTD54JE50F	POWER TRANSFORMER
T1 ⚠ (E, EG, EB, EH) (EF, EI)	SLTD54JS48E1	POWER TRANSFORMER
OSCILLATORS		
X301	SVQ16CKSS	16.9344MHZ
DISPLAYS		
FL601	SADD11	DISPLAY
FUSES		
F1 ⚠ (EK, XA, XB) (PA, PE, PC)	XBA2C016TB0S	FUSE, 250V, T160mA
F2 ⚠ (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	XBA2C008TB0	FUSE, 250V, T80mA
SWITCHES		
S1 ⚠	ESB8249V	POWER SWITCH
S2 ⚠ (EK, XA, XB) (PA, PE, PC)	SRDSHXW0251	SW, VOLTAGE SELECT
S101	SSPD5-1	SW, REST
S601- S610	EVQQS405K	SW, NUMERIC
S611, S612	EVQQS405K	SW, OPERATION
S613, S614	EVQQS405K	SW, OPERATION
S616, S617	EVQQS405K	SW, OPERATION
S618, S619	EVQQS405K	SW, OPERATION
S620, S621	EVQQS405K	SW, OPERATION
S622, S623	EVQQS405K	SW, OPERATION
S624, S625	EVQQS405K	SW, OPERATION
S626	EVQQS405K	SW, OPERATION
RELAYS		
RL801	SSYD3	RELAY

Ref. No.		Part No.	Description
CABINET AND CHASSIS			
1	Ⓚ	SKCLP520-KM	CABINET
1	Ⓢ	SKCLP520-SE	CABINET
2	Ⓚ	SGWLP420-KM	GRILLE
2	Ⓢ	SGWLP420-SE	GRILLE
3		SRUZ003N01	CLAMPER
4	Ⓢ	SBCD4650MA0B	BUTTON, NUMERIC
4	Ⓚ	SBCD4650ZK0B	BUTTON, NUMERIC
5	Ⓢ	SBCD4650MA0C	BUTTON, MEMORY
5	Ⓚ	SBCD4650ZK0C	BUTTON, MEMORY
6	Ⓢ	SBCD4660MA0A	BUTTON, REPEAT
6	Ⓚ	SBCD4660ZK0A	BUTTON, REPEAT
8	Ⓚ	SBN1161-2	KNOB, HEADPHONES
8	Ⓢ	SBN1161-3	KNOB, HEADPHONES
9	Ⓚ	SGYLP420-KM	FRONT PANEL
9	Ⓢ	SGYLP420-SE	FRONT PANEL
9-1		SGUD183	FILTER
9-2		SDUD16A-1	FILTER
9-3	Ⓢ	SGXD3100MA0A	ORNAMENT PLATE
9-3	Ⓚ	SGXD3100ZK0A	ORNAMENT PLATE
9-4	Ⓢ	SBCD3842MA0A	BUTTON, OPERATION
9-4	Ⓚ	SBCD3842ZK0B	BUTTON, OPERATION
10		SDUD17	PLATE
13		SUSD57	SPRING
14	Ⓢ	SBCD4640MA0A	BUTTON, SEARCH
14	Ⓚ	SBCD4640ZK0A	BUTTON, SEARCH
16	Ⓢ	SBCD4650MA0A	BUTTON, NUMERIC
16	Ⓚ	SBCD4650ZK0A	BUTTON, NUMERIC
17 (XL)	⚠	SJSD16	AC INLET
17 (M, MC, E, EK) (EG, EB, EH) (EF, EI, XA) (XB, PA, PE) (PC)	⚠	SJS9236	AC INLET
18	Ⓢ	SBC666	BUTTON, POWER
18	Ⓚ	SBC666-5	BUTTON, POWER
19		SUBD3-2	ROD
20		SHGD95-1	RUBBER CUSHION
23		SUSD65	SPRING (YELLOW)
24		SUSD42	SPRING (SILVER)
25		SUSD66	SPRING (BLUE)
27		SKLD5	INSULATOR
29 (E)		SGPLP420-KE	CHASSIS
29 (EB, EH, EF) (EI)		SGPLP420-KEB	CHASSIS
29 (EG)		SGPLP420-KEG	CHASSIS
29 (EK)		SGPLP420-KEK	CHASSIS
29 (M)		SGPLP420-KM	CHASSIS
29 (MC)		SGPLP420-KMC	CHASSIS
29 (PA, PE, PC)		SGPLP420-KPA	CHASSIS
29 (XA)		SGPLP420-KXA	CHASSIS
29 (XB)		SGPLP420-KXB	CHASSIS
29 (XL)		SGPLP420-KXL	CHASSIS
31		SJFD4	OUTPUT TERMINAL
34		SJJ134B	JACK, HEADPHONES
CONNECTORS			
41, 42		SJSD0905	CONNECTOR (CN401-405)
43, 44		SJSD0905	CONNECTOR (CN401-405)
45		SJSD0905	CONNECTOR (CN401-405)
46		SJSD1709	CONNECTOR (CN101)
47		EMCS0350Z	CONNECTOR (CN104)
48		EMCS0850Z	CONNECTOR (CN1)
49		EMCS0550Z	CONNECTOR (CN801)
50		SJTD713-R	CONNECTOR (CN302)
51		SRDJ001N14E	SHORTING PIN (CN102)
52		EMCS0550Z	CONNECTOR (CN407)
53		EMCS0552M	CONNECTOR (CN102)
SCREWS, WASHERS AND NUTS			
N1		XTV3+8JFZ	SCREW
N2		SHDD1-5	SCREW
N3		XTV3+8JFN	SCREW
N4		XTV3+8J	SCREW
N5	Ⓢ	SNE2129	SCREW
N5	Ⓚ	SNE2129-1	SCREW
N6		XTBS3+8JFZ1	SCREW
N7		SFXG172-01	SCREW
N8 (EK, XA, XB) (PA, PE, PC)		XTBS3+8JFZ1	SCREW

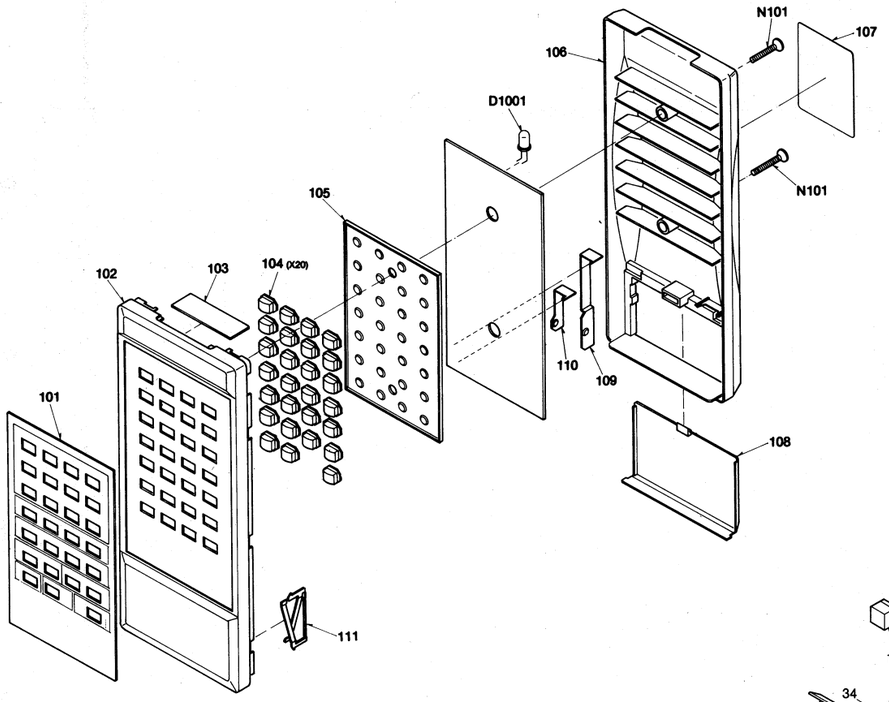
Ref. No.		Part No.	Description
LOADING MECHANICAL			
1		SIRLP420-KM	DISC TRAY
1-1		SHSD14	SHEET
1-2		SHGD49	RUBBER CUSHION
3		SHGD92	RUBBER
4	Ⓢ	SGXD240MA0D	ORNAMENT PLATE
4	Ⓚ	SGXD240ZK0C	ORNAMENT PLATE
5		SUSD29-1	SPRING
6		SIRD20-1	LEVER
7		SIRD16E-1	HOLDER ASS'Y
7-1		SHGD46	RUBBER CUSHION
9		SUWD46	BRACKET
10		SUXD25	SHAFT
11	⚠	S0AD30A-1	OPTICAL PICKUP
12		EWSL04A00000	HOLDER
13		SHGD131	STOPPER
14		S0RD10E	COIL
15		EWSTB0A00Q53	RESISTANCE UNIT
16		S0YD8E	YOKE
17		S0YD9	YOKE
18		SJGD5E	LOADING MOTOR
19		SHGD64	RUBBER
21		SDRD2	ROLLER
22		SUWD44	BRACKET
23		SHGD69	RUBBER
26		SIRD17-3E	CLAMPER
27		SIRD28-1	HOLDER
28		SDGD19	GEAR
29		SDGD20-2	DRIVE GEAR
31		SD0D8-1	RING
32		SRQA010N04	SPRING
33		SD0D7-1	TURNTABLE ASS'Y
34		SISD7E-4	LOADING BASE
39		SMBD2-1	BELT
40		SHRD23-2	LOCK SHAFT
41		S0MD9A	ROTOR
42		SXPD1780	SPINDLE P.C.B.
43		SHRD19-1	LEVER
44		SUSD31	SPRING
45		SUSD51	SPRING
47		SUWD58	PLATE
48		SUSD67-1	SPRING
49		SUSD68-1	SPRING
50		SGXD260ZK	PLATE
SCREWS,WASHERS & NUTS			
N1		SNSD10	SCREW
N2		XTN2+4G	SCREW
N3		XQN17+C6	SCREW
N4		XWE35D7BN	WASHER
N5		XTW3+8T	SCREW
N6		XXE26D5	SCREW
N7		SNSD9	SCREW
N8		XSN26+6	SCREW
N9		SFXW120-01	WASHER
N10		XSN26+8	SCREW
N11		XTN2+5G	SCREW
N12		XTV3+6BFN	SCREW
N13		XTV3+6GFZ	SCREW
N14		XTV3+8G	SCREW
N15		SFXGQ06N01	SCREW
N18		XTV3+14G	SCREW

Ref. No.		Part No.	Description
PACKINGS			
P1 (M, E, EK, XL) (EG, EB, EH) (EI, XA, XB) (PA, PE, PC)	Ⓚ	SPND224	CARTON BOX
P1 (MC)		SPND225	CARTON BOX
P1 (EF)	Ⓚ	SPND226	CARTON BOX
P1 (E, EK, XL, EG) (EB, EH, EI) (XA, XB, PA) (PE, PC)	Ⓢ	SPND227	CARTON BOX
P1 (EF)	Ⓢ	SPND228	CARTON BOX
P2		SPSD69	PAD
P3		SPSD70-1	PAD
P4		SFYH60X50	PROTECTION COVER
P5		SPSD68	SHEET
P6		SRHZJ02N01	PROTECTION COVER
P7		XZB26X17C03	POLYETHYLENE BAG
ACCESSORIES			
A1 (M)		SQUD251	INSTRUCTION MANUAL
A1 (EK)		SQUD254	INSTRUCTION MANUAL
A1 (EG)		SQUD255	INSTRUCTION MANUAL
A1 (EF)		SQUD256	INSTRUCTION MANUAL
A1 (EI)		SQUD257	INSTRUCTION MANUAL
A1 (XL, XA)		SQUD258	INSTRUCTION MANUAL
A1 (E, EB, EH)		SQULP420-KE	INSTRUCTION MANUAL
A1 (MC)		SQULP420-KMC	INSTRUCTION MANUAL
A1 (PA, PE, PC)		SQULP420-KPA	INSTRUCTION MANUAL
A1 (XB)		SQULP420-KXB	INSTRUCTION MANUAL
A2 (E, EG, EB, EH) (EF, EI)	⚠	SFDAC05E03	POWER CORD
A2 (EK)	⚠	SFDAC05G02	POWER CORD
A2 (XA, PA, PE) (PC)	⚠	SJA168-1	POWER CORD
A2 (MC)	⚠	SJA170	POWER CORD
A2 (M)	⚠	SJA170-1	POWER CORD
A2 (XL)	⚠	SJA173	POWER CORD
A2 (XB)	⚠	SJA183	POWER CORD
A3		SJP2249-1	OUTPUT CORD
A4 (XA, XB, PA) (PE, PC)	⚠	SJP9215	AC PLUG ADAPTOR
A6 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)		UM-3NE	BATTERY
A6 (M, MC)		UM-3NEP	BATTERY

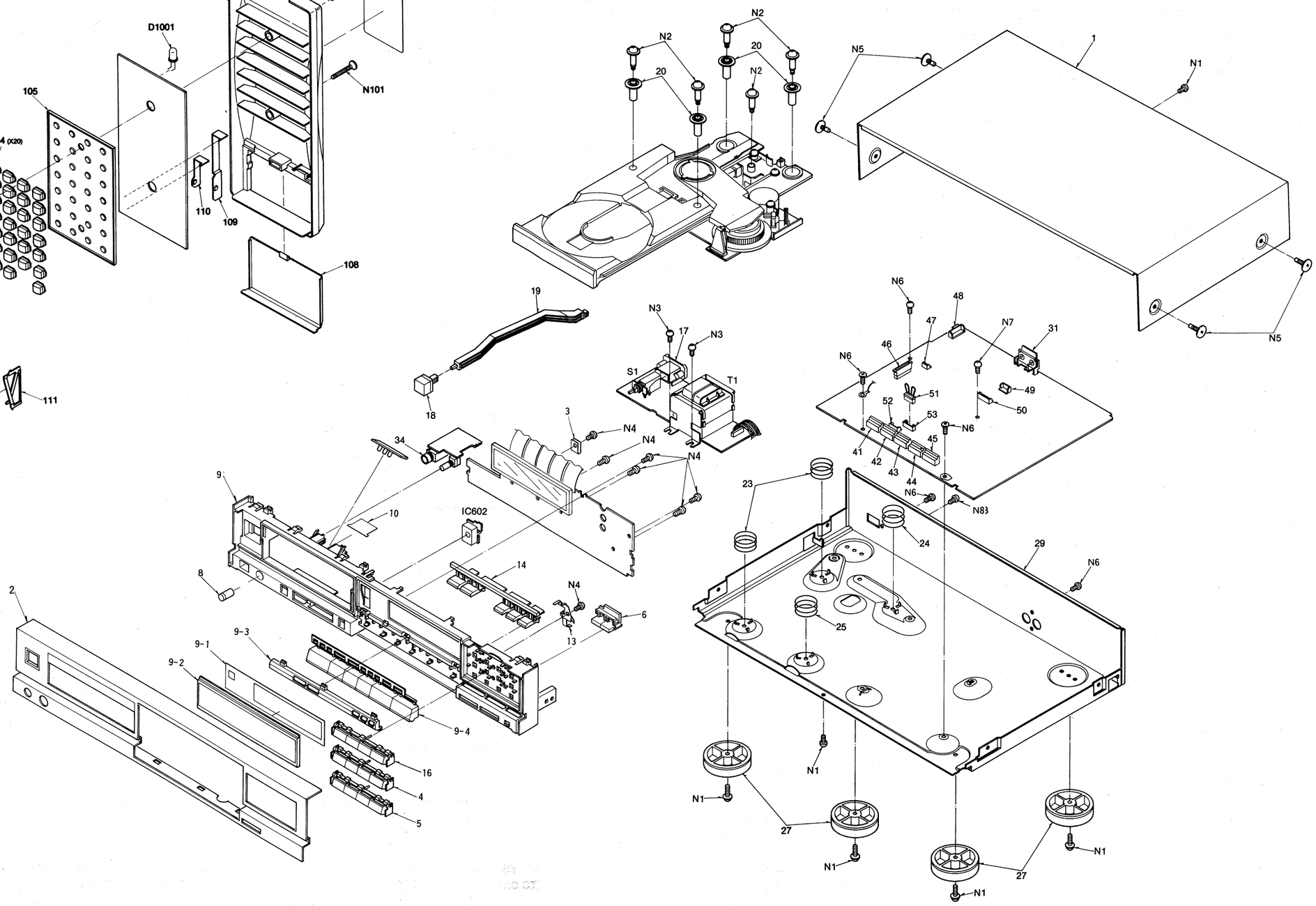
Ref. No.		Part No.	Description
I.C. (REMOTE CONTROL)			
IC1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)		MN6030B	I.C., TRANSMITTER
IC1 (M, MC)		MN6030CA	I.C., TRANSMITTER
TRANSISTORS (REMOTE CONTROL)			
Q1		UN1231	TRANSISTOR
DIODES (REMOTE CONTROL)			
D1		LN66-S	L.E.D
D2, D3		MA154WK	DIODE
D4, D5		MA154WK	DIODE
D6, D7		MA154WA	DIODE
OSCILLATOR (REMOTE CONTROL)			
X1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)		CSB420PB1	420 KHZ
X1 (M, MC)		CSB455EB1	455KHZ
RESISTORS (REMOTE CONTROL)			
R1		ERDS2TJ1R0	CARBON, 1Ω, 1/4W
CAPACITORS (REMOTE CONTROL)			
C1 (M, MC)		ECKD1H101KB	CERAMIC, 100PF, 50V
C1 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)		ECKD1H471KB	CERAMIC, 470PF, 50V
C2		ECKD1H101KB	CERAMIC, 100PF, 50V
(M, MC) C2 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)		ECKD1H121KB	CERAMIC, 120PF, 50V
C3		ECEA0JK101	ELECTROLYTIC, 100μF, 6.3V
REMOTE CONTROL TRANSMITTER			
101		UR64PP531	PANEL
102	Ⓚ	UR64CS119	TOP COVER
102	Ⓢ	UR64CS119A	TOP COVER
103		UR64SB125	PLATE
104		UR64BT123AA	BUTTON
105		UR64CT122	RUBBER, SWITCH
106	Ⓚ	UR64CS120	BOTTOM COVER
106	Ⓢ	UR64CS120A	BOTTOM COVER
107 (M, MC)		UR64LB532	LABEL
107 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	Ⓚ	UR64LB533	LABEL
107 (E, EK, XL, EG) (EB, EH, EF) (EI, XA, XB) (PA, PE, PC)	Ⓢ	UR64LB534	LABEL
108	Ⓚ	UR64EC121	COVER, BATTERY
108	Ⓢ	UR64EC121A	COVER, BATTERY
109		UR64TD128	TERMINAL (-)
110		UR64TD127	TERMINAL (+)
111		UR52TD101	TERMINAL (COMMON)
SCREWS,WASHERS & NUTS(REMOCON)			
N101	Ⓢ	XTS26+12GFC	SCREW
N101	Ⓚ	XTS26+12GFZ	SCREW

■ EXPLODED VIEW

• **Remote control parts**

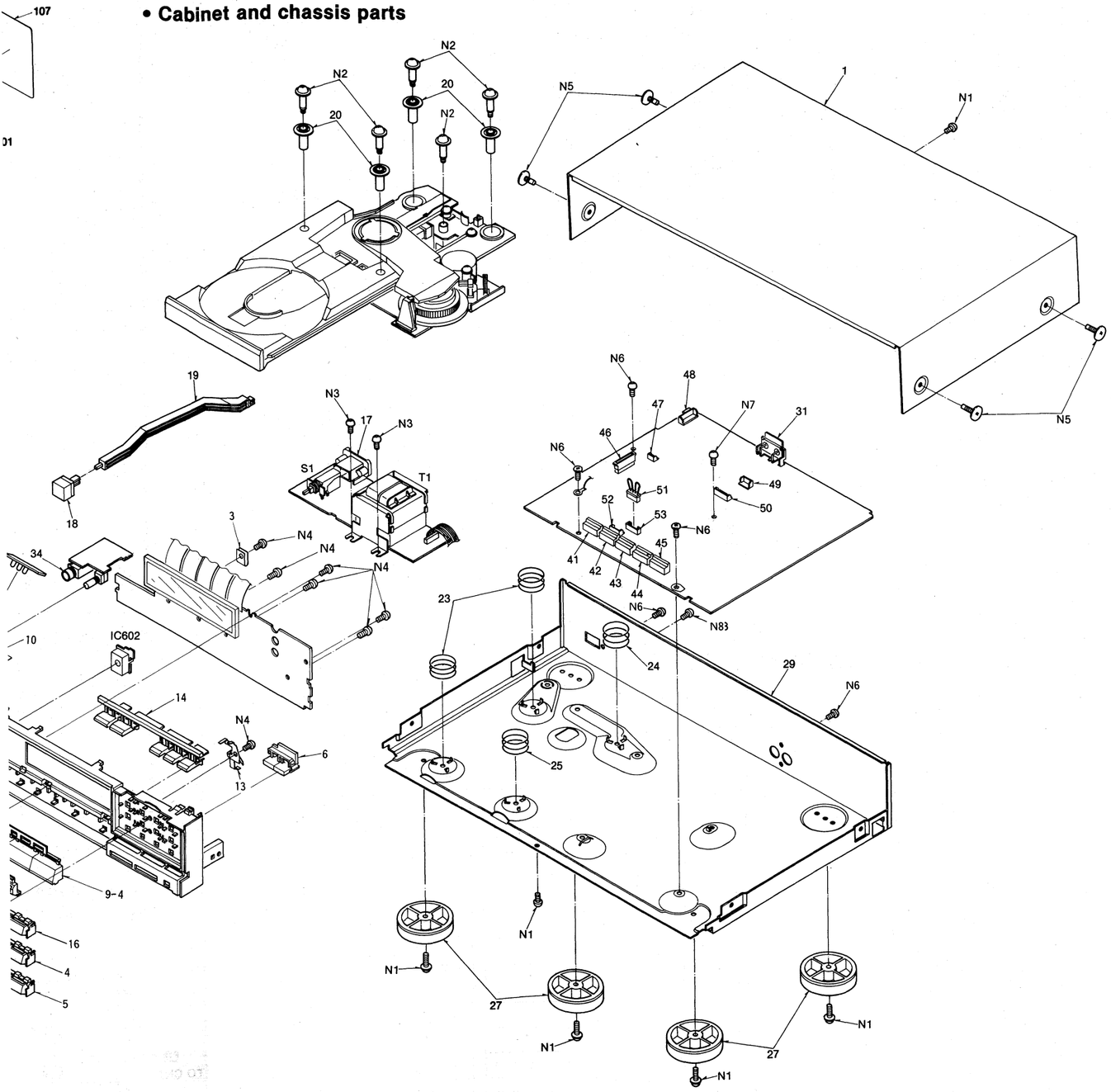


• **Cabinet and chassis parts**

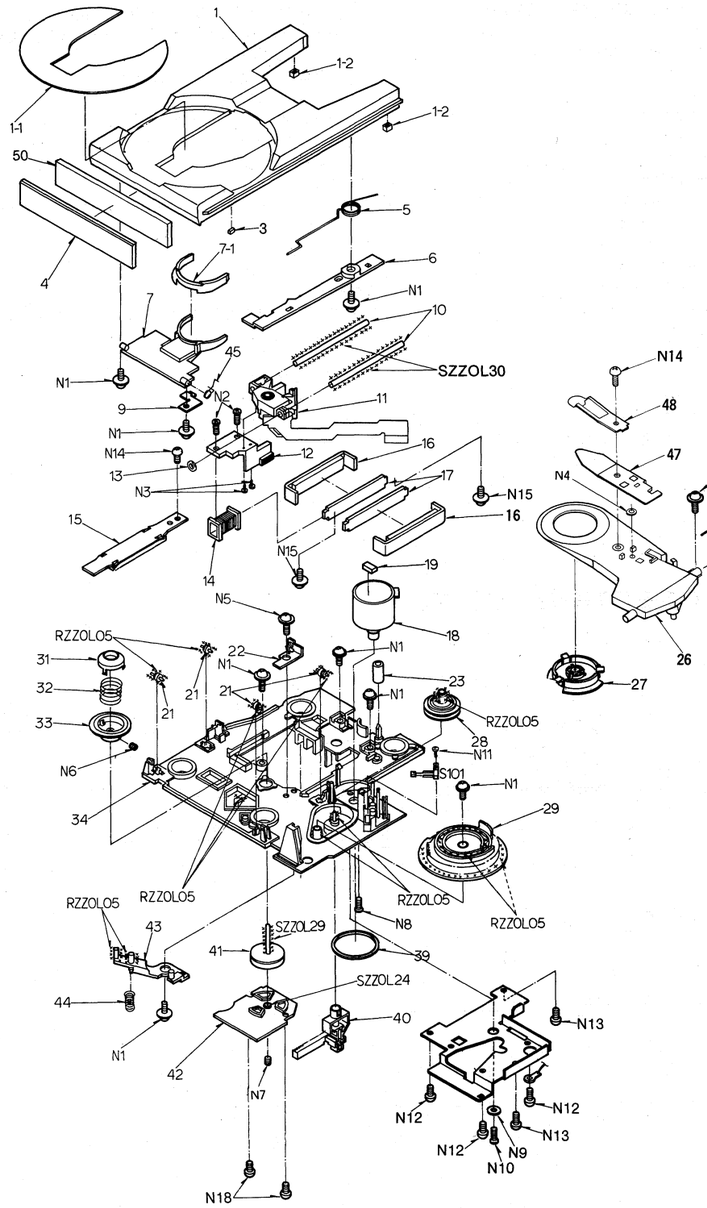


Note: Wh
app
mai

• Cabinet and chassis parts



• Loading unit



Note: When changing mechanism parts, apply the specified grease to the areas marked "XX" in the drawing.

■ SCHEMATIC DIAGRAM

(This schematic diagram may be modified at any time with the development of new technology.)

Notes:

1. **S1** : Power switch in "**on**" position.
2. **S2** : Voltage selector switch. (For [EK], [XA], [XB], [PA], [PE] and [PC] areas.)
3. **S101** : Disc holder open/close detection switch.
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16. **S623** : Repeat switch.
17. **S624** : Play switch.
18. **S625** : Stop switch.
19. **S626** : Open/close switch.
20. The voltage value and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis.

    Accordingly, there may arise some error in voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1 kHz, L+R, 0 dB), others are voltage values in stop mode.
21. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
22. ——— : Positive voltage lines and negative voltage lines.
    ⟿ : Audio signal lines.

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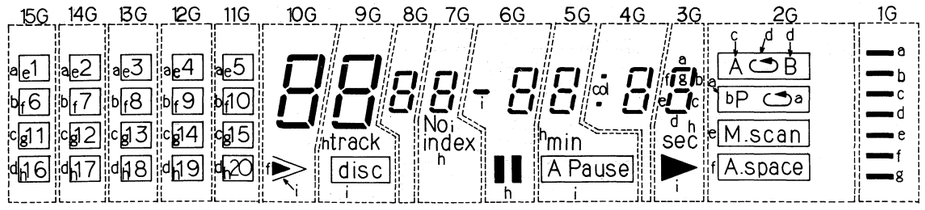
■ INTERNAL CONNECTIONS OF FL

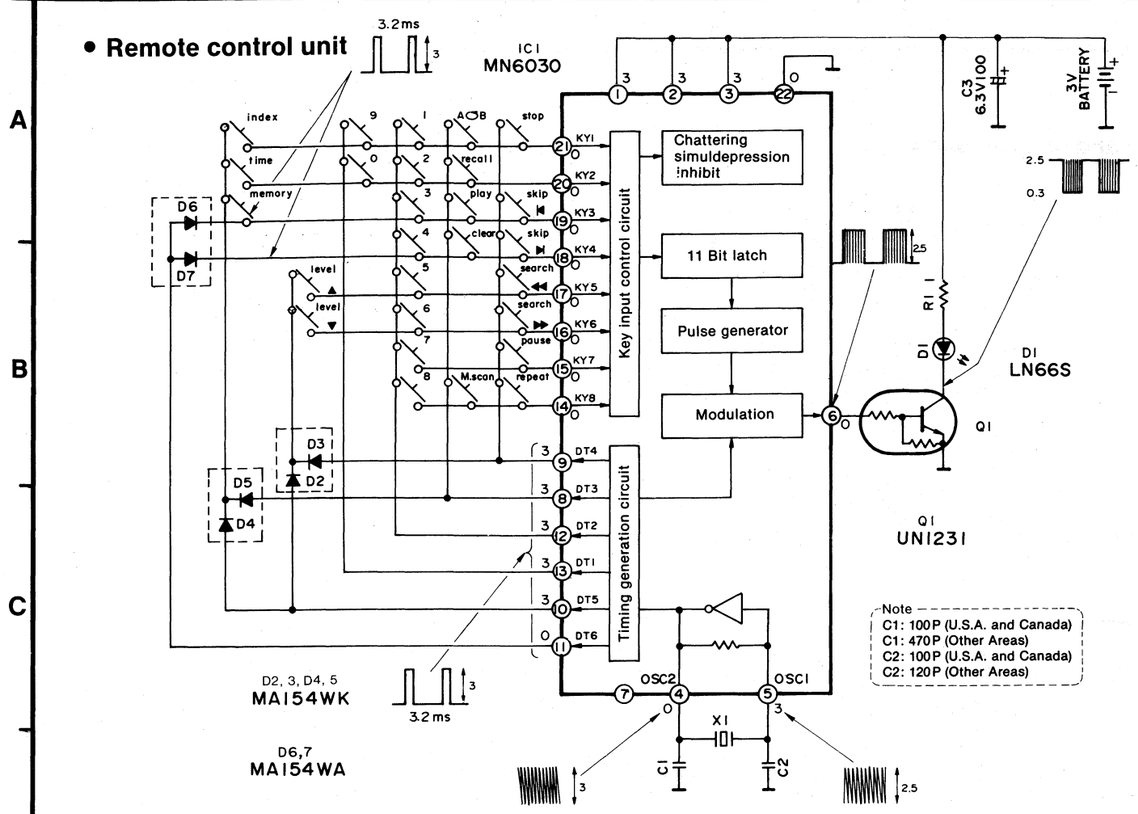
• Grid connection diagram



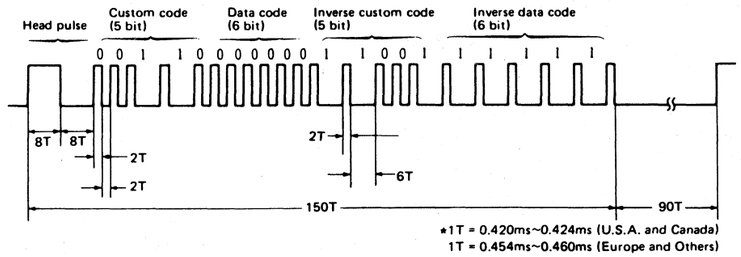
• Anode connection table

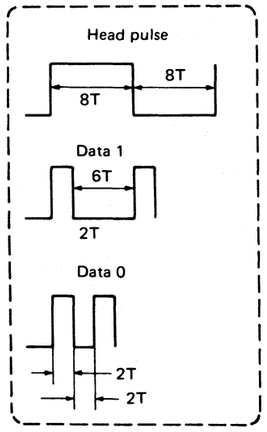
	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	□1	□2	□3	□4	□5	a	a	a	a	a	a	a	a	⟲	0dB
b	□6	□7	□8	□9	□10	b	b	b	b	b	b	b	b	P	2dB
c	□11	□12	□13	□14	□15	c	c	c	c	c	c	c	c	A⟲	4dB
d	□16	□17	□18	□19	□20	d	d	d	d	d	d	d	d	B	6dB
e	1	2	3	4	5	e	e	e	e	e	e	e	e	M.scan	8dB
f	6	7	8	9	10	f	f	f	f	f	f	f	f	A.space	10dB
g	11	12	13	14	15	g	g	g	g	g	g	g	g		12dB
h	16	17	18	19	20	▶	track	-	index	❚❚	min	col	sec		-
i	-	-	-	-	-	>	disc	-	No.	—	A Pause	-	▶	-	-

• Remote control unit



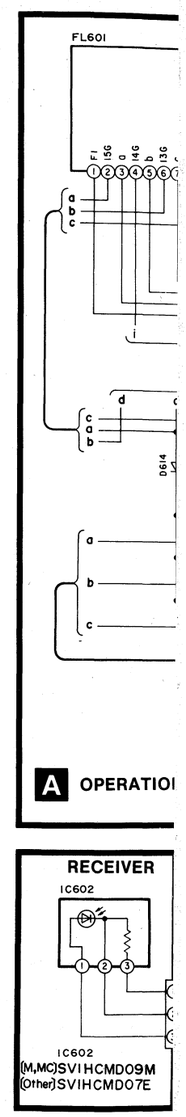
• Remote control data code


Head pulse
Custom code (5 bit)
Data code (6 bit)
Inverse custom code (5 bit)
Inverse data code (6 bit)
0 0 0 1 1 0 0 0 0 0 0 0 1 1 0 0 1 1 1 1 1 1 1 1
8T
8T
2T
2T
2T
6T
150T
90T
*1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)



Button	Data Code
1	0 0 0 0 1 0
2	1 0 0 0 1 0
3	0 1 0 0 1 0
4	1 1 0 0 1 0
5	0 0 1 0 1 0
6	1 0 1 0 1 0
7	0 1 1 0 1 0
8	1 1 1 0 1 0
9	0 0 0 1 1 0
0	1 0 0 1 1 0
memory	0 1 0 1 0 1
index	0 0 0 1 0 1
time	1 0 0 1 0 1
stop	0 0 0 0 0 0

Button	Data Code
clear	1 1 0 1 0 0
A-B repeat	0 0 0 1 0 0
repeat	1 1 1 0 0 0
M scan	1 1 1 1 0 0
recall	1 0 0 1 0 0
◀◀ search	0 0 1 0 0 0
search ▶▶	1 0 1 0 0 0
▮◀ skip	0 1 0 0 0 0
skip ▶▮	1 1 0 0 0 0
❚❚ pause	0 1 1 0 0 0
play ▶	0 1 0 1 0 0
▼ level	1 0 1 0 0 1
level ▲	0 0 1 0 0 1



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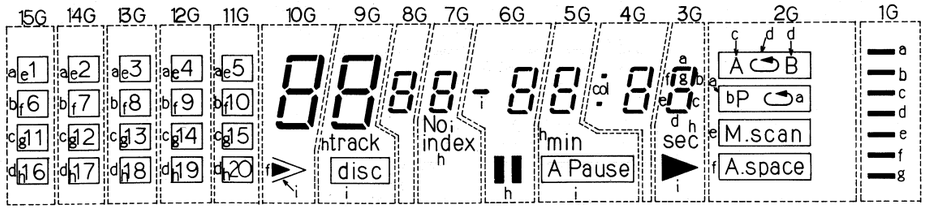
■ INTERNAL CONNECTIONS OF FL

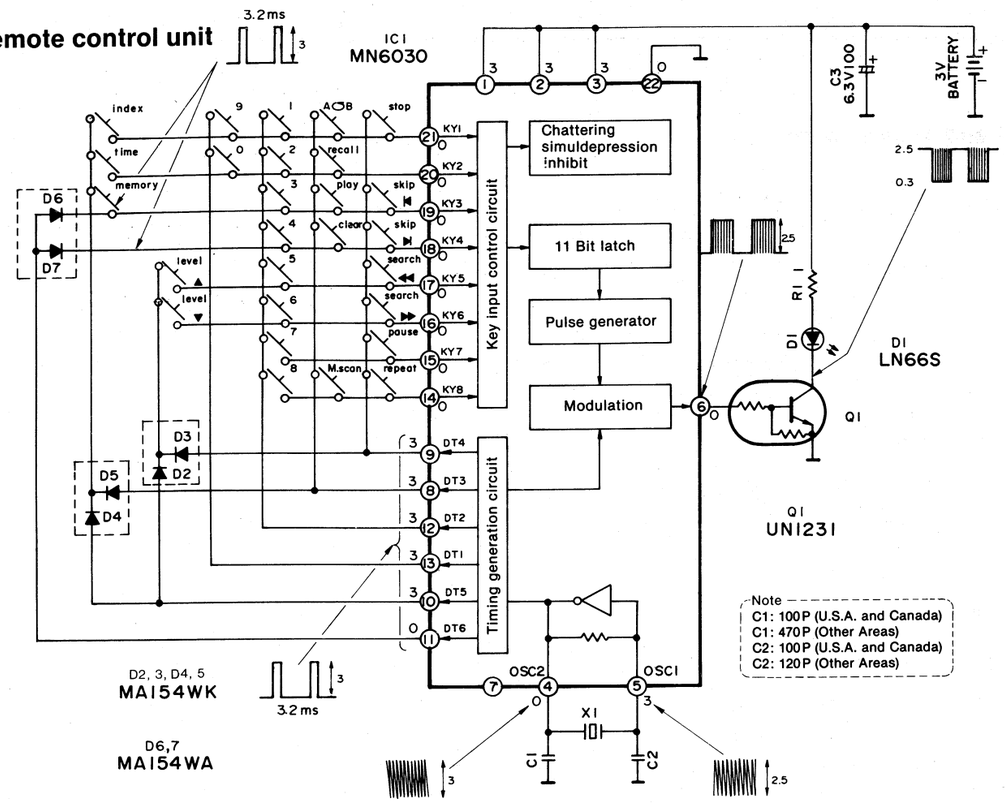
• Grid connection diagram



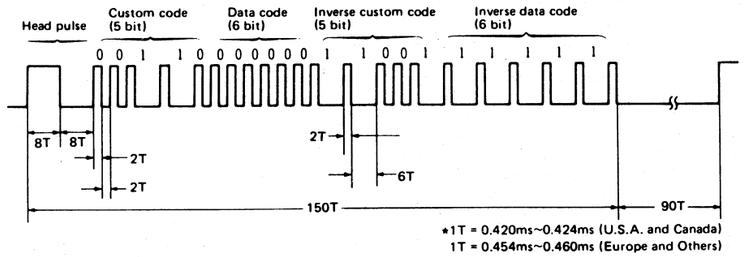
• Anode connection table

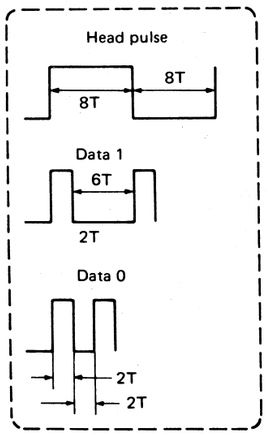
	15G	14G	13G	12G	11G	10G	9G	8G	7G	6G	5G	4G	3G	2G	1G
a	□1	□2	□3	□4	□5	a	a	a	a	a	a	a	a	C	0dB
b	□6	□7	□8	□9	□10	b	b	b	b	b	b	b	b	P	2dB
c	□11	□12	□13	□14	□15	c	c	c	c	c	c	c	c	AC	4dB
d	□16	□17	□18	□19	□20	d	d	d	d	d	d	d	d	B	6dB
e	1	2	3	4	5	e	e	e	e	e	e	e	e	M.scan	8dB
f	6	7	8	9	10	f	f	f	f	f	f	f	f	A.space	10dB
g	11	12	13	14	15	g	g	g	g	g	g	g	g		12dB
h	16	17	18	19	20	▶	track	-	index	❙❙	min	col	sec		-
i	-	-	-	-	-	>	disc	-	No.	—	A Pause	-	▶	-	-

• Remote control unit



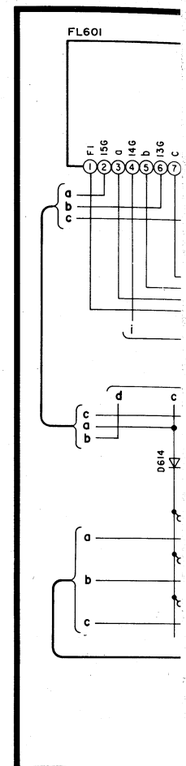
• Remote control data code


Head pulse
Custom code (5 bit)
Data code (6 bit)
Inverse custom code (5 bit)
Inverse data code (6 bit)
0 0 1 1 0 0 0 0 0 0 0 0 1 1 0 0 1 1 1 1 1 1
8T 8T
2T
2T
2T
6T
150T
90T
*1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)

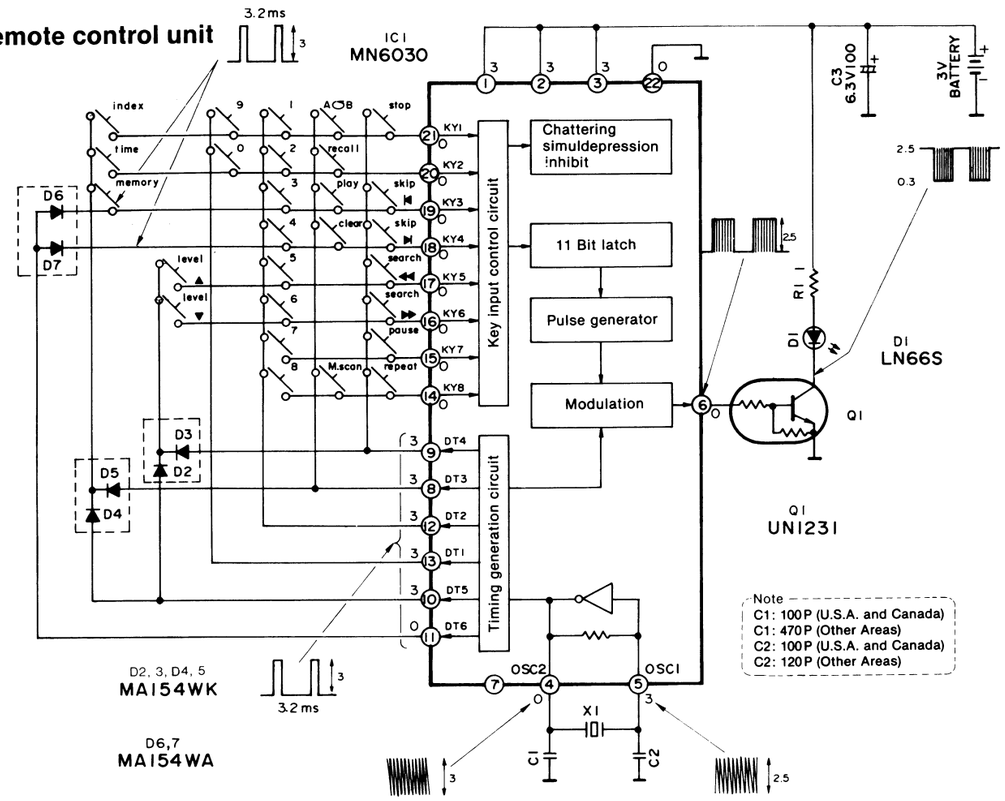


Button	Data Code
1	0 0 0 0 1 0
2	1 0 0 0 1 0
3	0 1 0 0 1 0
4	1 1 0 0 1 0
5	0 0 1 0 1 0
6	1 0 1 0 1 0
7	0 1 1 0 1 0
8	1 1 1 0 1 0
9	0 0 0 1 1 0
0	1 0 0 1 1 0
memory	0 1 0 1 0 1
index	0 0 0 1 0 1
time	1 0 0 1 0 1
stop	0 0 0 0 0 0

Button	Data Code
clear	1 1 0 1 0 0
A-B repeat	0 0 0 1 0 0
repeat	1 1 1 0 0 0
M scan	1 1 1 1 0 0
recall	1 0 0 1 0 0
◀◀ search	0 0 1 0 0 0
search ▶▶	1 0 1 0 0 0
▮◀ skip	0 1 0 0 0 0
skip ▶▮	1 1 0 0 0 0
❙❙ pause	0 1 1 0 0 0
play ▶	0 1 0 1 0 0
▼ level	1 0 1 0 0 1
level ▲	0 0 1 0 0 1

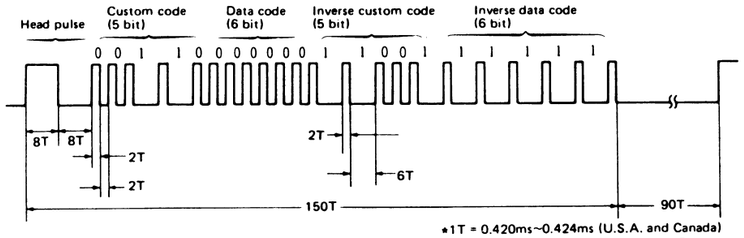


• Remote control unit

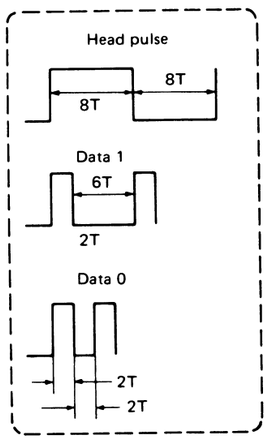


Note
C1: 100P (U.S.A. and Canada)
C1: 470P (Other Areas)
C2: 100P (U.S.A. and Canada)
C2: 120P (Other Areas)

• Remote control data code

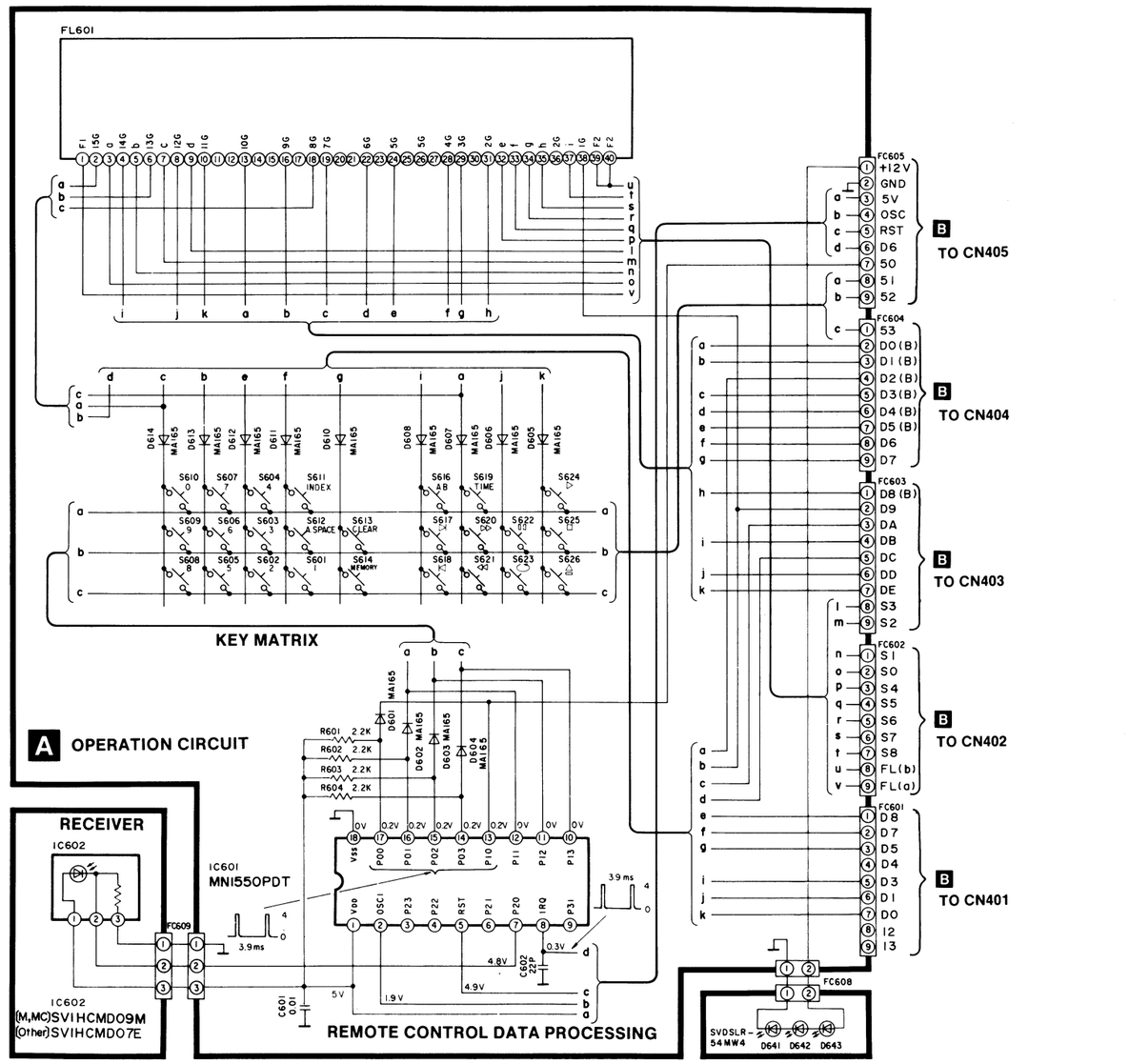


*1T = 0.420ms~0.424ms (U.S.A. and Canada)
1T = 0.454ms~0.460ms (Europe and Others)



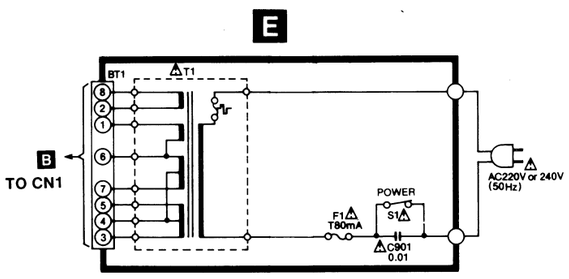
Button	Data Code
1	0 0 0 0 1 0
2	1 0 0 0 1 0
3	0 1 0 0 1 0
4	1 1 0 0 1 0
5	0 0 1 0 1 0
6	1 0 1 0 1 0
7	0 1 1 0 1 0
8	1 1 1 0 1 0
9	0 0 0 1 1 0
0	1 0 0 1 1 0
memory	0 1 0 1 0 1
index	0 0 0 1 0 1
time	1 0 0 1 0 1
stop	0 0 0 0 0 0

Button	Data Code
clear	1 1 0 1 0 0
A-B repeat	0 0 0 1 0 0
repeat	1 1 1 0 0 0
M scan	1 1 1 1 0 0
recall	1 0 0 1 0 0
◀◀ search	0 0 1 0 0 0
search ▶▶	1 0 1 0 0 0
⏮ skip	0 1 0 0 0 0
skip ⏭	1 1 0 0 0 0
⏸ pause	0 1 1 0 0 0
play ▶	0 1 0 1 0 0
▼ level	1 0 1 0 0 1
level ▲	0 0 1 0 0 1

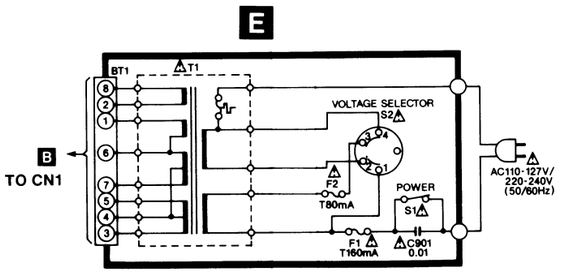


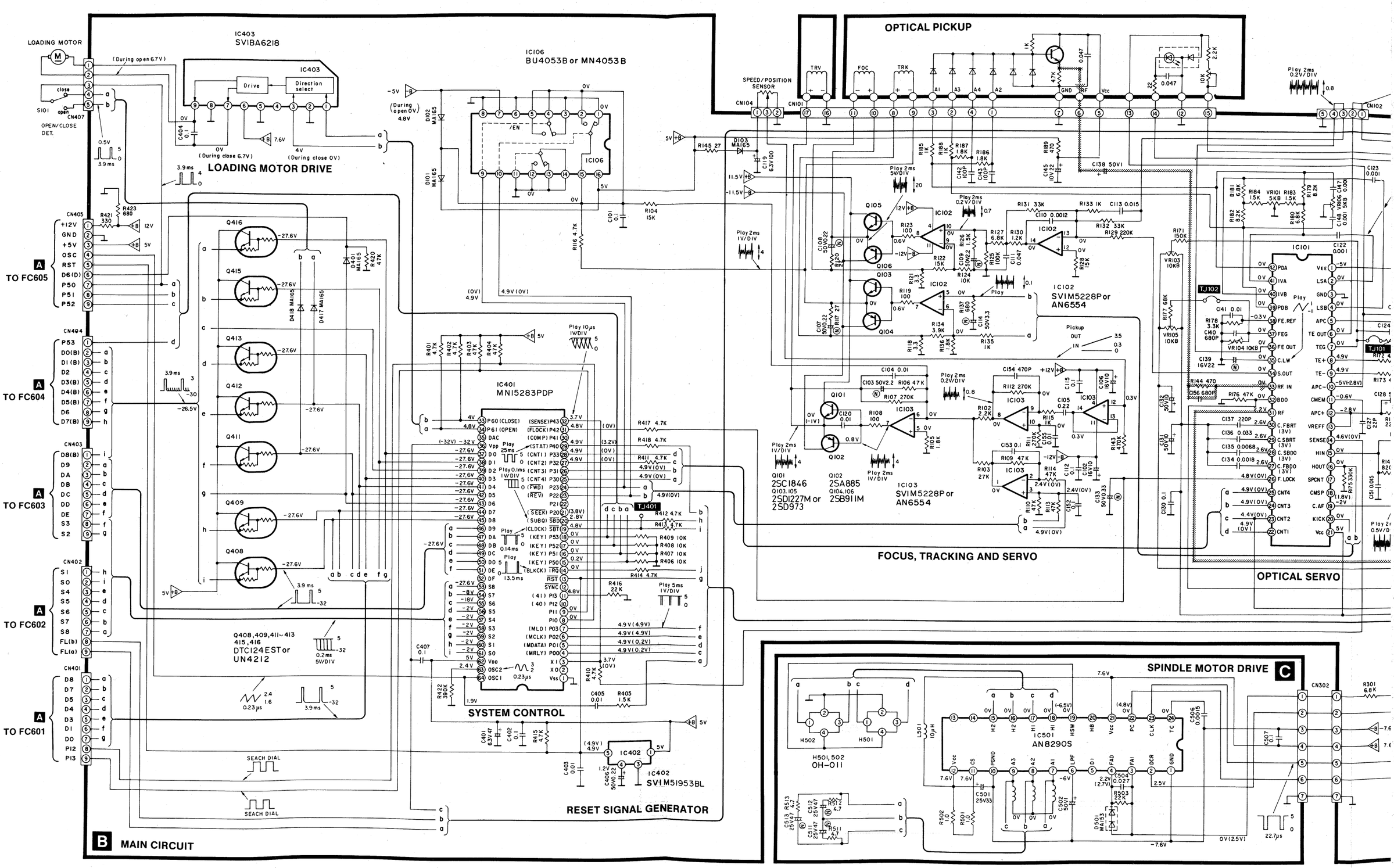
A OPERATION CIRCUIT

• Power supply circuit (For Continental Europe and Australia)



• Power supply circuit (For others)




LOADING MOTOR
IC403
SVIBA6218
LOADING MOTOR DRIVE
OPEN/CLOSE DET.
IC106
BU4053B or MN4053B
OPTICAL PICKUP
SPEED/POSITION SENSOR
CN104
CN101
TRV
FOC
TRK
A1
A3
A4
A2
GND
RF
Vcc
IC102
SVIM5228P or AN6554
IC101
IC103
SVIM5228P or AN6554
Q101
2SC1846
Q103,105
2SDI227M or 2SD973
Q102
2SA885
Q104,106
2SB911M
FOCUS, TRACKING AND SERVO
OPTICAL SERVO
IC401
MN15283PDP
SYSTEM CONTROL
IC402
SVIM51953BL
RESET SIGNAL GENERATOR
Q408,409,411~413 415,416
DTC124EST or UN4212
SEACH DIAL
TO FC605
TO FC604
TO FC603
TO FC602
TO FC601
CN405
CN404
CN403
CN402
CN401
SPINDLE MOTOR DRIVE
IC501
AN8290S
H501, 502
OH-011
B MAIN CIRCUIT
C

REGULATOR

IC1 AN78M12 IC2 AN79M12
Q13 2SA1309
IC304 EHDGAI243
IC11 AN78M05
IC12 AN79N05
D15-18 ISR35200A
Q11 2SC1846
Q12 2SA885
IC4,5 SVIFU15

DATA SLICE AND PLL

IC304

DIGITAL SIGNAL PROCESSING

IC301 MN6617

DIGITAL FILTER

IC302 MN6618A

D/A CONVERTER

IC807 SVIPCM54JP-V

OPTICAL SERVO

IC101 AN8370S
Q110 2SC2021M or 2SD637
IC102 SVIM5228Por AN6554

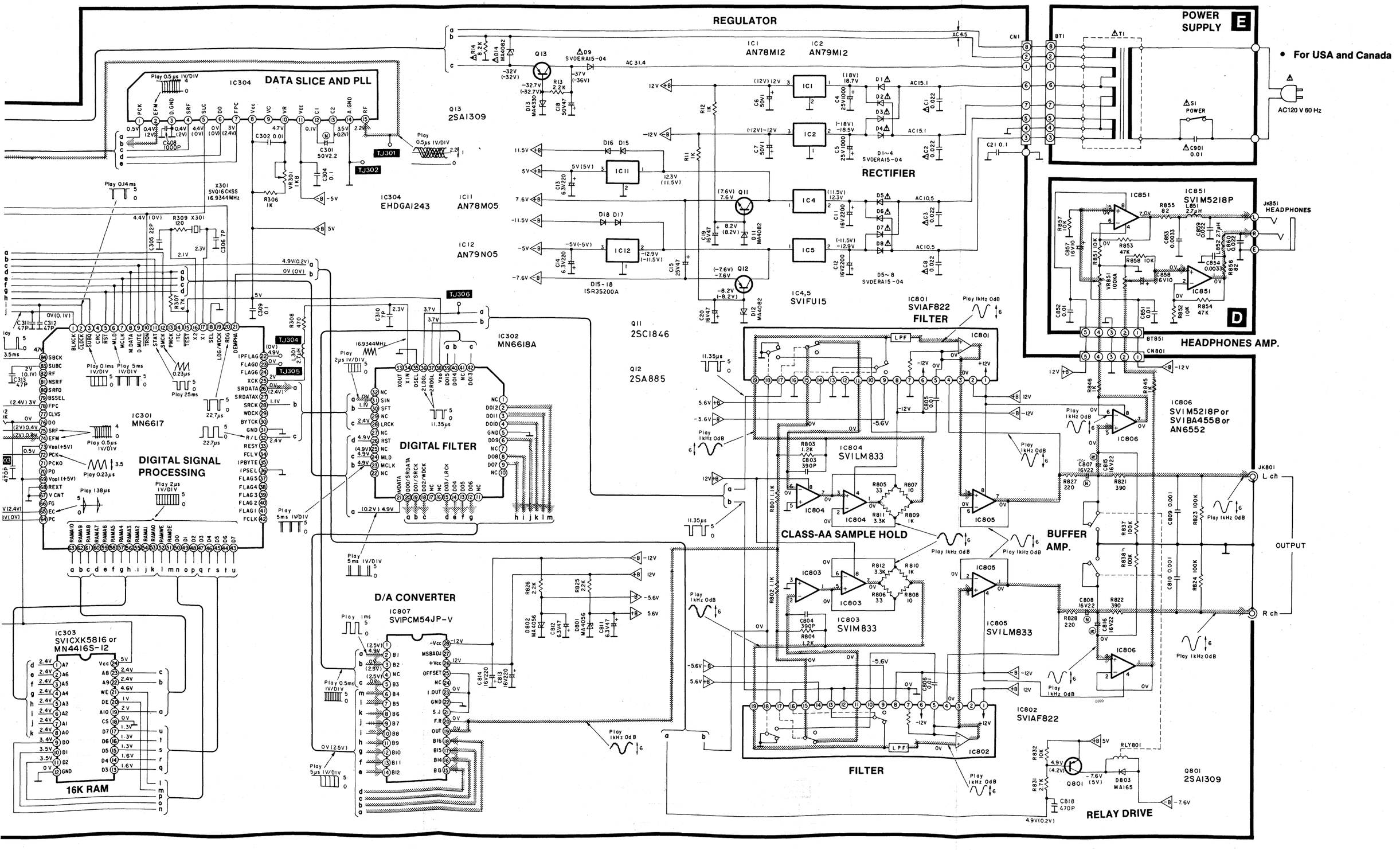
SPINDLE MOTOR DRIVE C

IC501 AN8290S

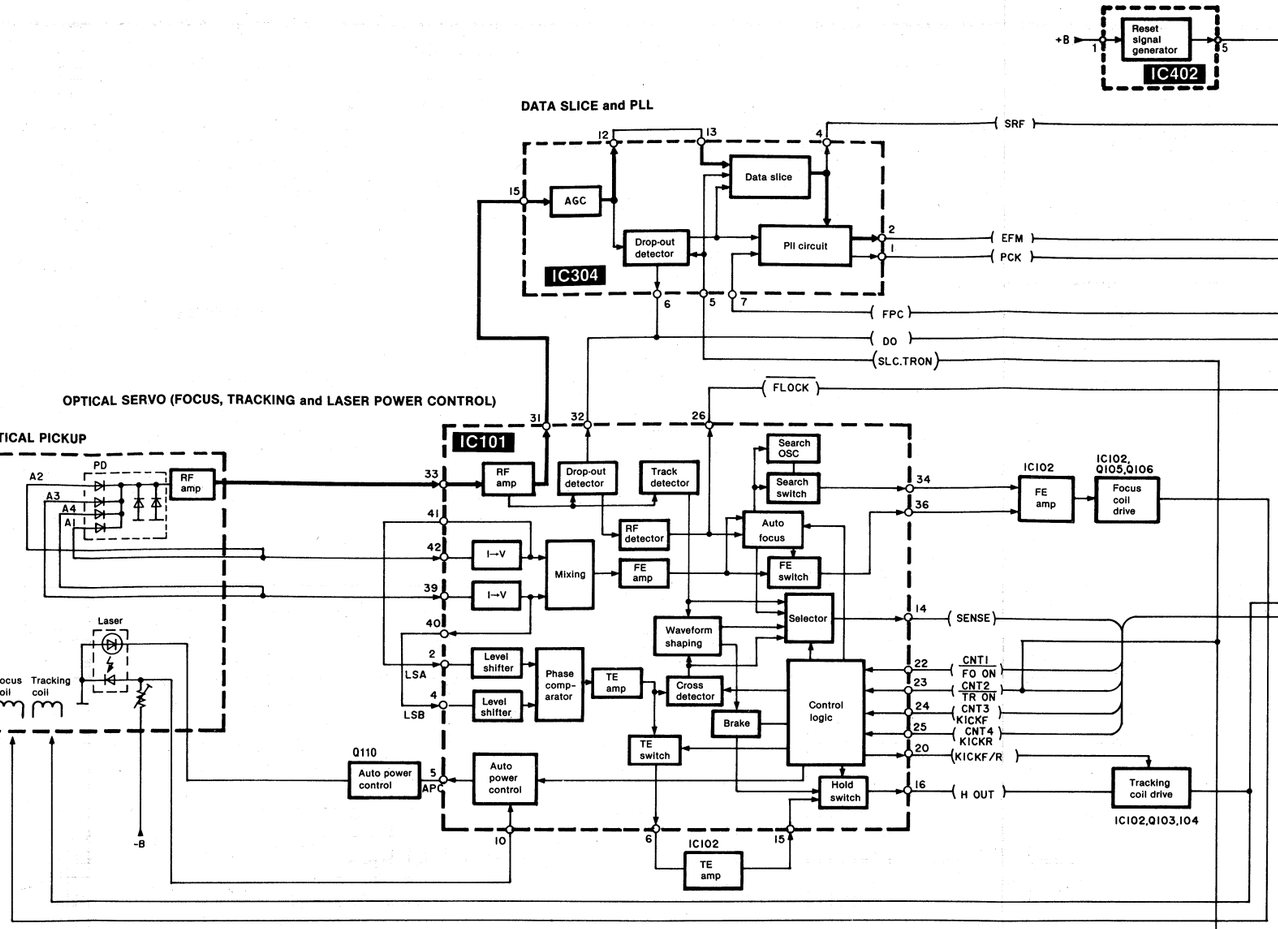
IC303 SVICXK5816 or MN4416S-12
16K RAM

CLASS-AA SAMP

IC803 SVIME


REGULATOR
IC1 AN78M12
IC2 AN79M12
Q13 2SA1309
IC11 AN78M05
IC12 AN79N05
IC4,5 SVIFU15
Q11 2SC1846
Q12 2SA885
RECTIFIER
D1~4 SVDERA15-04
D5~8 SVDERA15-04
D15~18 ISR35200A
POWER SUPPLY E
• For USA and Canada
AC120 V 60 Hz
HEADPHONES AMP.
IC851 SVIM5218P
JK851 HEADPHONES
DATA SLICE AND PLL
IC304 EHDGAI243
X301 SVQ16CKSS 16.9344MHz
IC301 MN6617
DIGITAL SIGNAL PROCESSING
IC303 SVICXK5816 or MN4416S-12
16K RAM
IC302 MN6618A
DIGITAL FILTER
IC807 SVIPCM54JP-V
D/A CONVERTER
IC801 SVIAF822 FILTER
IC804 SVILM833
CLASS-AA SAMPLE HOLD
IC806 SVIM5218P or SVIBA4558 or AN6552
IC805 SVILM833
BUFFER AMP.
IC802 SVIAF822
FILTER
JK801 L ch
JK801 R ch
OUTPUT
Q801 2SAI309
RELAY DRIVE
RLY801
D803 MA165

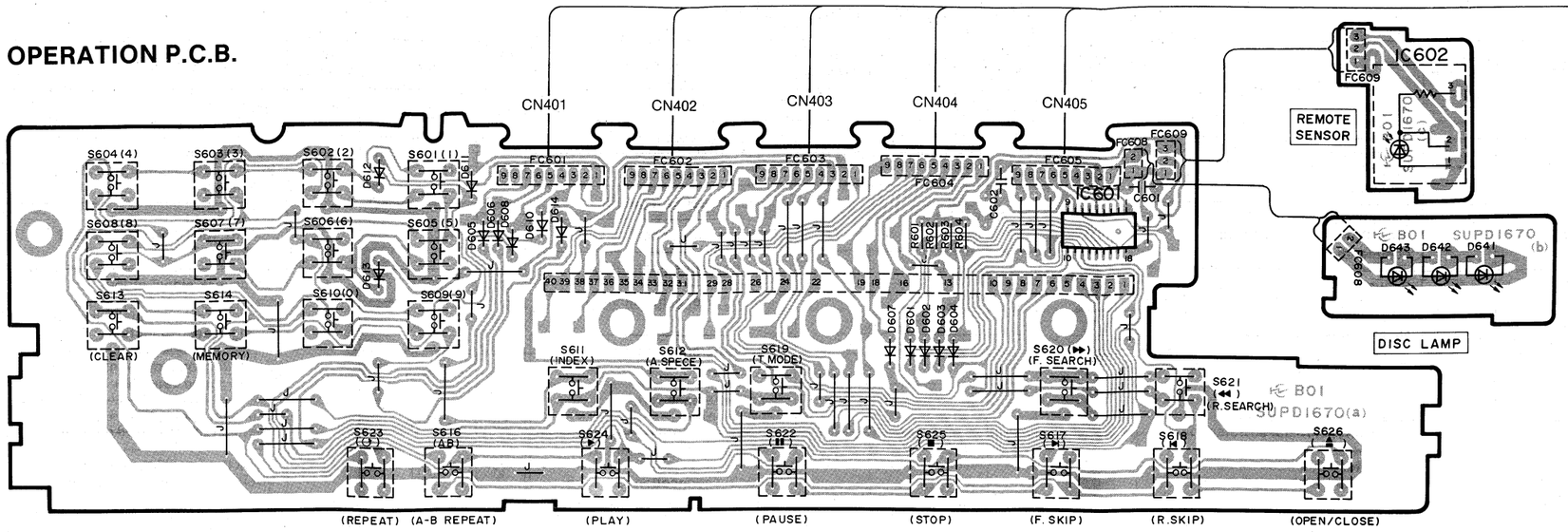
BLOCK DIAGRAM



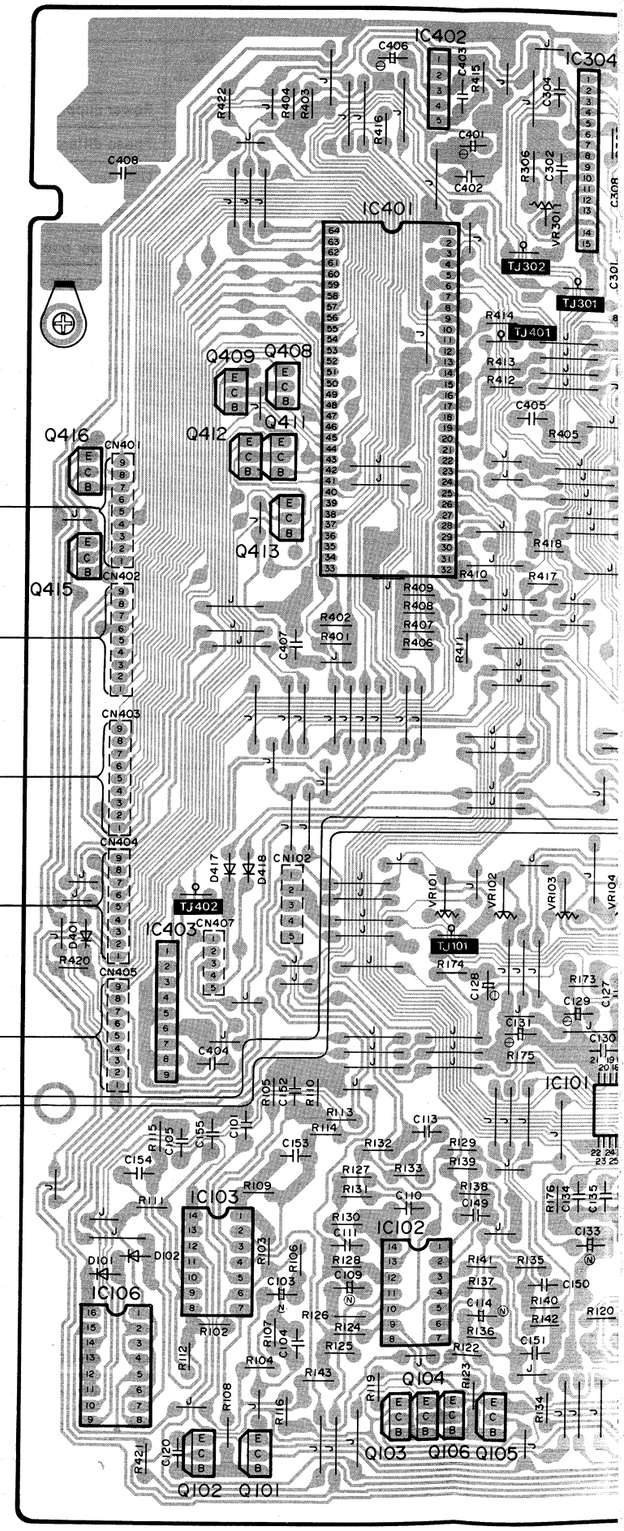
IC401
SYSTEM CONTROL, and FL DRIVE
SMCK
RST
BLKCK
SUBQ
CLDCK
Motor drive
Selector
IC403
Loading motor
MUTE
MDATA
MCLK
MLD
STAT
FLOCK
SENSE
CNT4
CNT3
CNT2
CNT1
KEY MATRIX
F L
IC106
Switch
IC103
Speed/ Position detector
Resistans unit
IC103
Traverse servo
IC103 Q101,102
Traverse coil drive
Traverse coil
TRAVERSE SERVO
IC402
REMOTE CONTROL DATA PROCESSING
IC602
Remote control receiver
3V
Q1
LED drive
Modulation
Pulse generator
11 bit lach
Chattering simuldepression inhibit
Timing generation circuit
Key input control circuit
IC1
Key switch
REMOTE CONTROL TRANSMITTER
FL601
AC 4.5V
T1
Power transformer
AC IN
S1 POWER
Q13
Regulator
D9
Rectifier
-32V
12V
-12V
11.5V
5V
7.6V
-7.6V
-5V
-11.5V
IC1
IC2
IC11
IC12
Q11
Q12
IC4
IC5
IC protector
D1~4
D5~8
16K RAM
IC303
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable, output enable
E.F.M. DECODER ERROR CORRECTION and CLV SERVO
IC302
Synchronize det
Frequency detector
Syn-drome
CCU
Synchronize protection
EFM decoder
Working RAM
ALU
PCK timing
Sub-code decoder
Compen-sation
Address generator
Rough servo
Severe servo
Processing
CLV control
MCK timing
Track counter
CPU interface
FPC
EFM
PCK
CLDCK
BLKCK
SUBQ
EMPHA
SRF
PC
EC
X301
16.9344MHz
DO
TRON
OSC
SMCK
RDG
WE
OE
Address
+B
DIGITAL FILTER
Input resistor
RAM1 address counter
RAM2 address counter
RAM1
RAM2
Logic
ROM
Acqum-lator
Over flow limitter
Output resistor
Timing generator
CPU interface
IC807
D/A converter
Relay drive
RLY801
Relay
IC804
CLASS-AA sample hold
IC805
Buffer
IC801
IC802
IC803
LPF
IC806
IC851
Head phones amp
L ch
R ch
Head phones

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

A OPERATION P.C.B.

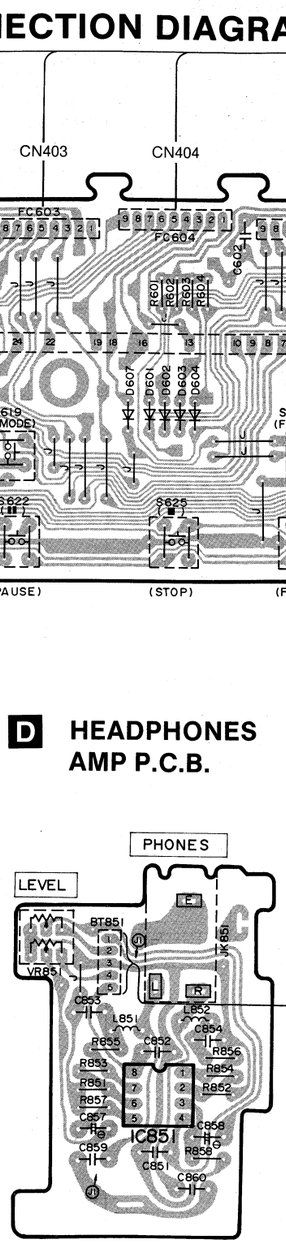


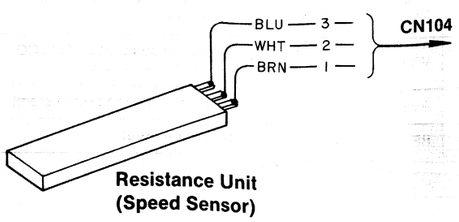
B MAIN P.C.B.

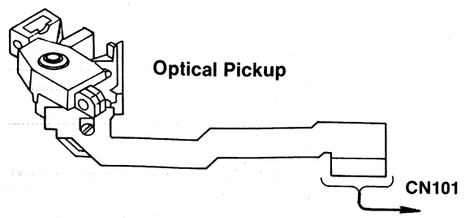


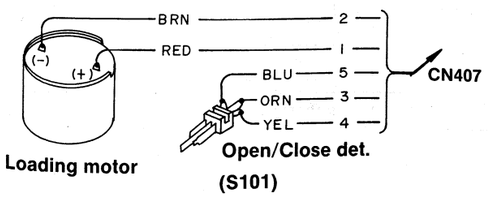
C SPINDLE MOTOR DRIVE P.C.B.

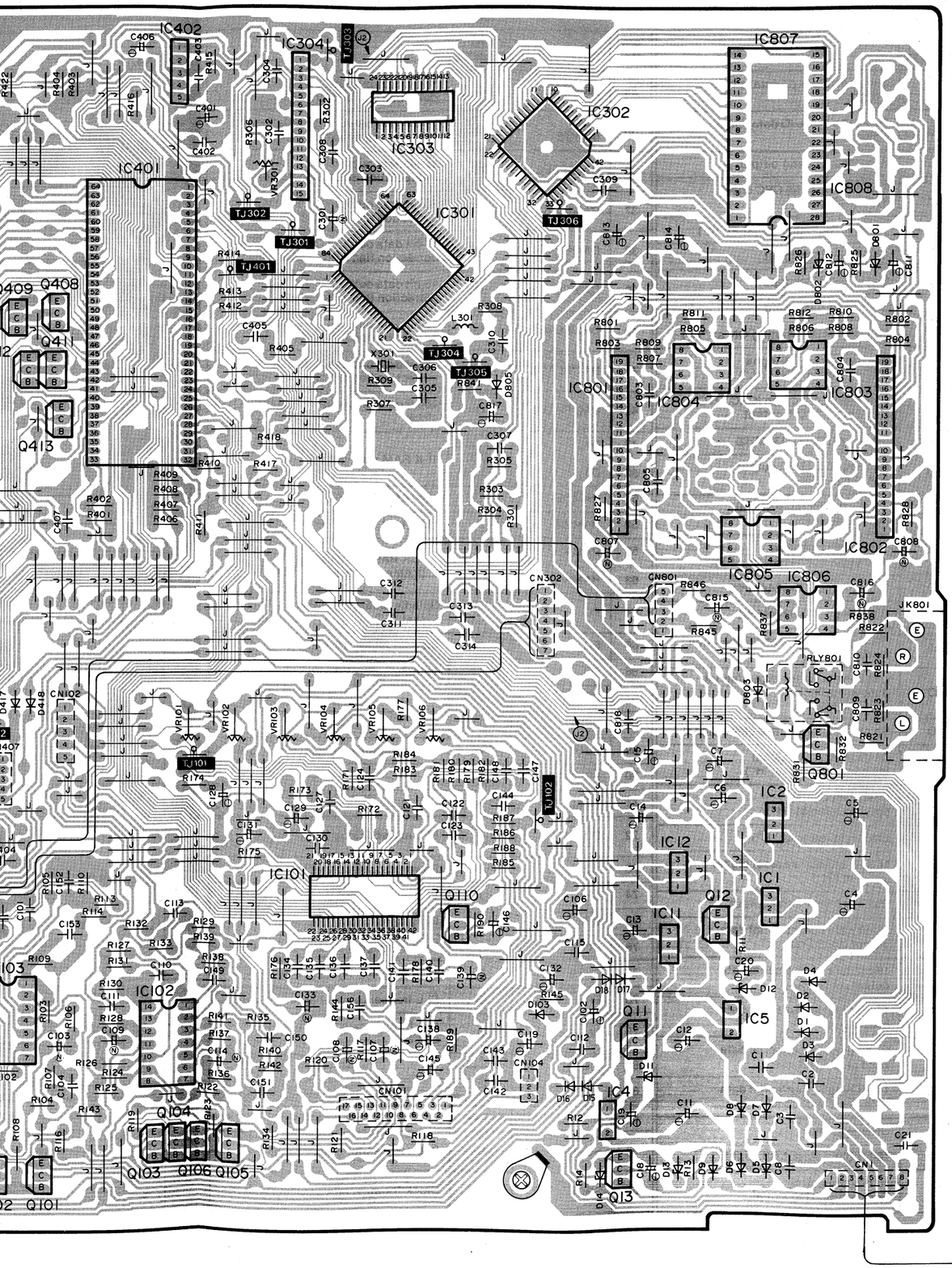
D HEADPHONES AMP P.C.B.





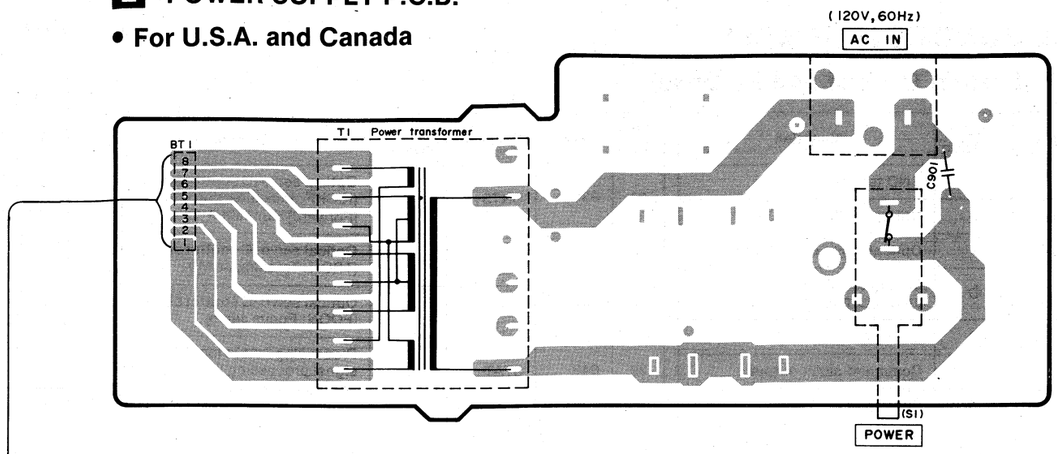




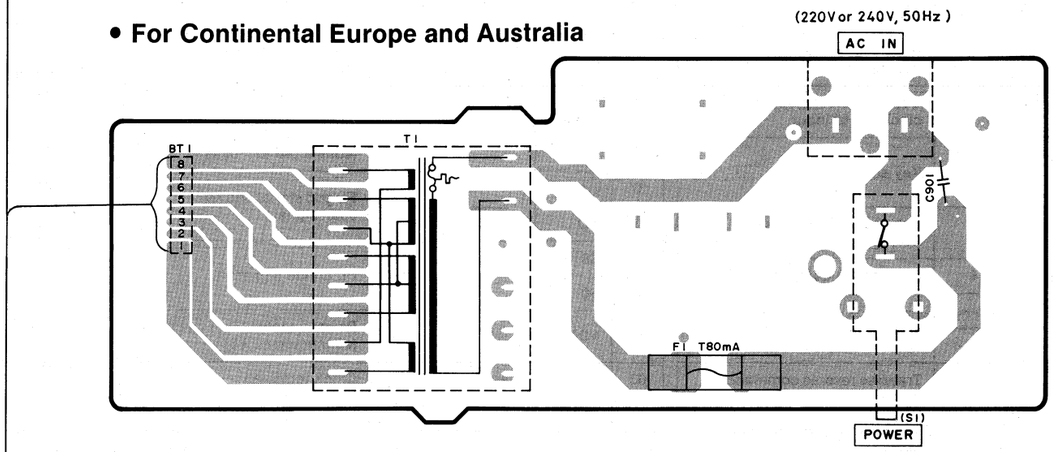


E POWER SUPPLY P.C.B.

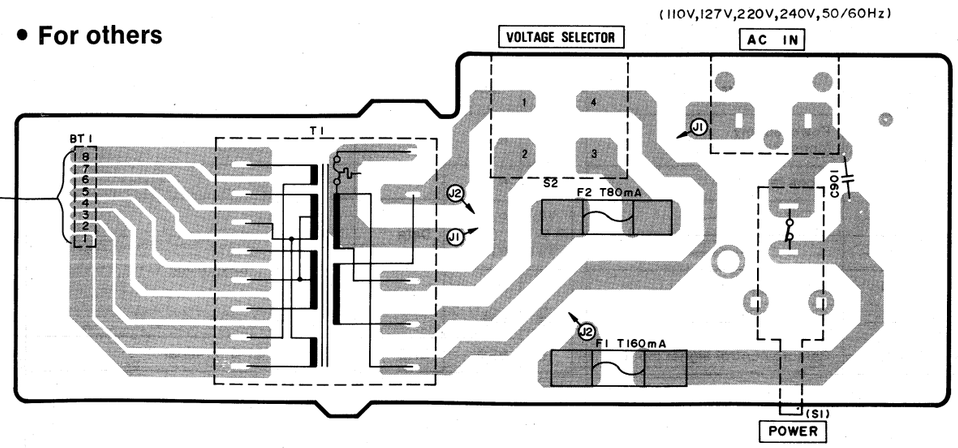
- **For U.S.A. and Canada**



- **For Continental Europe and Australia**



- **For others**



■ TERMINAL FUNCTION OF LSI

• MN15283PDP (System Control and FL Drive)

Pin No.	Mark	Singnal	I/O Devision	Function
1	VSS	GND	I	GND terminal
2	X0	——	O	Not used (Open)
3	X1	SENSE	I	Optical servo condition input
4	P00	MRLY	O	Muting control signal (muting ON at "H")
5	P01	M DATA	O	Command data output
6	P02	MCLK	O	Command clock output
7	P03	MLD	O	Command load output
8	P10	——	I	Search dial signal input
9	P11	——	I	Search dial signal input
10	P12	——	——	Not used (Open)
11	P13	——	——	———
12	$\overline{SYNC}$	——	——	Not used (Open)
13	$\overline{RST}$	RESET	I	Reset signal input (reset at "L")
14	$\overline{IRQ}$	BLKCK	I	Sub-code block (Q data) clock (75Hz) input
15 ⟆ 18	P50 ⟆ P53	KEY	I	Key scan input
19	$\overline{SBT}$	$\overline{CLDCK}$	I	Sub-code frame clock (7.35kHz)
20	$\overline{SBD}$	SUBQ	I	Sub-code Q data input
21	P20	SEEK	——	———
22	P21	——	——	Not used (Open)
23	P22	$\overline{TRV\text{-}R}$	O	Traverse reverse command signal
24	P23	$\overline{RRV\text{-}F}$	O	Traverse forward command signal
25	P30	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)
26	P31	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
27	P32	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
28	P33	CNT1	O	Optical servo IC control signal (FOON: Focus servo)
29	P40	STAT	I	Processing status input from signal processing LSI traverse position detection
30	P41	COMP	——	Not used (Open)
31	P42	$\overline{FLOCK}$	I	Optical servo condition (focus) input
32	P43	$\overline{SENSE}$	I	Optical servo condition (track cross) input
33	P60	$\overline{CLOSE}$	O	Loading motor close command (ON at "L")
34	P61	$\overline{OPEN}$	O	Loading motor open command (ON at "L")
35	DAC	DAC	O	———
36	VPP	——	I	FL drive power supply (connected to −32V)
37 ⟆ 52	D0 ⟆ DD	——	O	FL grid signal and key scan signal
53 ⟆ 61	S8 ⟆ S0	——	O	FL anode signal
62	VDD	——	I	Power supply (connected to +5V)
63	OSC2	——	I	Clock terminal
64	OSC1	——	I	Clock input

• MN1550PDT (Remote Control Signal Processing)

Pin No.	Mark	Singnal	I/O Devision	Function
1	VDD	——	I	Power supply (connected to +5V)
2	OSC	SMCK	I	Clock input
3	P23	——	——	———
4	P22	——	——	———
5	RST	RESET	I	Reset signal input
6	P21	——	——	———
7	P20	——	I	Remote control signal input
8	IRQ	——	I	Program enable/de-enable control
9	P31	——	——	———
10 ⟆ 13	P10 ⟆ P13	Data	I	Key strobe
14 ⟆ 17	P00 ⟆ P03	Data		
18	VSS	GND	I	GND terminal

• MN6617 (Digital Signal Processing: EFM Decoder, Error Correction, CLV Servo)

Pin No.	Mark	I/O Devision	Function
1	BLKCK	O	Sub-code block (Q data) clock (75Hz)
2	$\overline{CLDCK}$	O	Sub-code frame (Q data) clock (7.35kHz)
3	$\overline{SUBQ}$	O	Sub-code (Q data) output
4	CRC	O	Sub-code (Q data) CRC check (Not used, open)
5	$\overline{RST}$	I	Reset signal input (reset at "L")
6	MLD	I	Command load input
7	MCLK	I	Command clock input
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (muting ON at "H")
10	$\overline{TRON}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336MHz)
13	PMCK	O	Pitch control clock output Not used, open)
14	ITC	I	Track counter input signal (Not used, open)
15	$\overline{TEST}$	I	Test mode selection (Not used, connected to +5V)
16	X2	O	Clock output (16.9344MHz)
17	X1	I	Clock input (16.9344MHz)
18	SEL	I	DA output parallel/serial selection (serial at "L")
19	LDG/WDCK	O	L channel deglitch signal/serial data word clock. (Not used, open)
20	RDG	O	Spindle motor control clock signal
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16K RAM address reset signal (reset at "H")
25	XCK	O	Clock (16.9344MHz) output
26	DA15/ SRDATA	O	16-bit data output/serial data output (MSB first)
27	DA14/ SRDATAX	O	16-bit data output/serial data output (LSB first)
28	DA13/SRCK	O	16-bit data output/serial data beat clock
29	DA12/WDCK	O	16-bit data output/serial data word clock (Not used)
30	DA11/ BYTCK	O	16-bit data output/serial data byte clock (Not used)
31	GND	I	GND terminal
32	DA10/R/L	O	16-bit data output/R/L signal
33	DA9/RESY	O	16-bit data output/ Resynchronizing signal
34	DA8/FCLV	O	16-bit data output/Synchronizing detection signal (Nor used)
35	DA7/ IPBYTE	O	16-bit data output/Interpolation flag for each byte (Not used)
36	DA6/IPSEL	I/O	16-bit data output/ interpolation inhibit (Nor used)
37	DA5/FLAG5	O	16-bit data output/C2 decoder correction flag 3 (Not used)
38	DA4/FLAG4	O	16-bit data output/C2 decoder correction flag 2 (Not used)
39	DA3/FLAG3	O	16-bit data output/C2 decoder correction flag 1 (Not used)
40	DA2/FLAG2	O	16-bit data output/C1 decoder correction flag 2 (Not used)
41	DA1/FLAG1	O	16-bit data output/C1 decoder correction flag 1 (Not used)
42	DA0/FLCK0	O	16-bit data output/Crystal frame clock
43 ⟆ 50	D7 ⟆ D0	I/O	16K RAM data output
51	RAMOE	O	16K RAM $\overline{OE}$ signal
52	RAMWE	O	16K RAM $\overline{WE}$ signal
53 ⟆ 63	RAMA 0 ⟆ RAMA10	O	16K RAM address signal (RAMA0: LSB, RAMA10: MSB)
64	PC	O	Spindle motor ON signal (ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	VCNT	——	———
68	REXT	——	———
69	VDD	I	Power supply (connected to +5V)
70	PD	——	———
71	PCKO	——	———
72	PCK	I	PLL extract clock input
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (Drop-out at "H")
77	CLVS	O	11T servo OK signal (OK at "H")
78	FPC	O	PLL frequency comparision signal
79	RSSEL	O	PLL frequency in take operation signal
80	SRFO	——	———
81	NSRF	——	———
82	RF	——	———
83	SUBC	O	Sub-code serial output data
84	SBCK	I	Clock for sub-code serial output

• AN8370S (Optica

Pin No.	Mark	De
1	VEE	
2	LSA	
3	GND	
4	LSB	
5	APC	
6	TEOUT	
7	TEG	
8	TE+	
9	TE−	
10	APC−	
11	C•MEM	
12	APC+	
13	VREF	
14	SENSE	
15	HIN	
16	HOUT	
17	SPCNT	
18	C•MSP	
19	C•AF	
20	KICK R/$\overline{F}$	
21	VCC	
22	CNT1	

• EHDGA1243 (Data

Pin No.	Mark	I Dev
1	PCK	
2	EFM	
3	D•GND	
4	SRF	
5	SLC	
6	DC	
7	FPC	
8	VCC	

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• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Devision	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE+	I	Phase difference-voltage conversion (+)
9	TE−	I	Phase difference-voltage conversion (−)
10	APC−	O	Laser Power inversion input
11	C•MEM	I	Capacitor connection for phase difference memory
12	APC+	I	Laser power non-inversion input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, open)
18	C•MSP	I	Track-cross reference speed setting capacitor connection (not used, open)
19	C•AF	I	Auto focus timer capacitor connection
20	KICK R/$\overline{F}$	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)
22	CNT1	I	Control input ($\overline{FOON}$: Focus servo ON signal)

Pin No.	Mark	I/O Devision	Function
23	CNT2	I	Control input ($\overline{TRON}$: Tracking servo ON signal)
24	CNT3	I	Control input (KICKF: Kick direction [forward] command)
25	CNT4	I	Control input (KICKR: Kick direction [reverse] command)
26	$\overline{F•LOCK}$	O	Focus lock signal output
27	C•FBDO	O	Capacitor connection for inversion RF high speed detection
28	C•SBDO	O	Capacitor connection for inversion RF low speed detection
29	C•SBRT	O	Capaictor connection for non-inversion RF low speed detection
30	C•FBRT	O	Capacitor connection for non-inversion RF high speed detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RFIN	I	RF signal input
34	S•OUT	O	Focus search signal output
35	C•LW	I	Capacitor connection for triangular wave generation
36	FE•OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE•REF	I	Focus error comparision voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current/voltage conversion output (B)
41	IVA	O	Current/voltage conversion output (A)
42	PDA	I	Photo detector current input (A)

• EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
1	PCK	O	Clock output extracted from SRF
2	EFM	O	EFM signal output synchronized with PCK
3	D•GND	I	GND terminal (digital system)
4	SRF	O	RF signal output data-sliced into digital value
5	SLC	I	Slice level control signal input
6	DC	O	Drop-out detection pulse output
7	FPC	I	Frequency comparison error signal input
8	VCC	I	Power supply (connected to +5V)

Pin No.	Mark	I/O Devision	Function
9	NC	——	Non connection
10	VR	I	Resistor connection for VCO oscillation frequency
11	VEE	I	Power supply (connected to −5V)
12	VC1	I	Capacitor connection for VCO oscillator frequency
13	VC2	I	Capacitor connection for VCO oscillator frequency
14	A•GND	I	GND terminal (analog system)
15	RF	I	RF signal input

• AN8370S (Optical Servo Control)

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20	KICK R/$\overline{F}$	O	Track kick signal output
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Pin No.	Mark	I/O Devision	Function
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35	C•LW	I	Capacitor connection for triangular wave generation
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37	FEG	I	Focus error gain adjusting input
38	FE•REF	I	Focus error comparision voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current/voltage conversion output (B)
41	IVA	O	Current/voltage conversion output (A)
42	PDA	I	Photo detector current input (A)

• EHDGA1243 (Data Slice and PLL)

Pin No.	Mark	I/O Devision	Function
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6	DC	O	Drop-out detection pulse output
7	FPC	I	Frequency comparison error signal input
8	VCC	I	Power supply (connected to +5V)

Pin No.	Mark	I/O Devision	Function
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10	VR	I	Resistor connection for VCO oscillation frequency
11	VEE	I	Power supply (connected to −5V)
12	VC1	I	Capacitor connection for VCO oscillator frequency
13	VC2	I	Capacitor connection for VCO oscillator frequency
14	A•GND	I	GND terminal (analog system)
15	RF	I	RF signal input

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